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E K I S T I C S

ABSTRACTS

ON

THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

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The aim of Ekistics is to gather together a selection of timely abstracts and excerpts from articles published throughout the world on the subject of housing and planning in underdeveloped countries. The contents are derived in large part from protected materials and may not be reprinted in whole or in part without the permission of the respective authors.

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EDITORIAL

One of the most important considerations in EKISTICS -- the science of human settlement -- is the view taken of the human habitat. Some may view the habitat as a fixed, physical machine which man has adapted as a place in which to live -- and this could apply to both dwellings and settlements. Implicit in the study of EKISTICS, as presented here and elsewhere, is a different view of the human habitat: one in which living men (not abstract Man) are constantly, dynamically, influencing and being influenced by the environment in which they live. This theme runs through much of the work with which we are concerned.

Housing at Priory Lane, Roehampton in London demonstrates this idea in a large scale residential project. Mixed development - the juxtaposition of different types and sizes of dwellings, in high and low buildings within the same scheme - works well here because of the skill of design used. An approach to housing policies in Malaya points up different problems but a need for the same general view of the habitat. Interesting here is the need to provide different kinds of architectural treatment for dwellings in the conservative rural areas and the more socially mobile urban periphery. The way a nation organizes to provide resources for shelter -- especially for low-income families--may determine the success or failure of its undertakings.

The national provision of housing as part of a national social and economic program is becoming more and more a feature of governments to-day, and a comparison of the housing finance in Malaya with that of Doxiadis Associates program for Lebanon may be rewarding to others working in this field. Both take practicable and forward-looking approaches to this problem. It will be noted that both lay stress on the building of houses for purchase by installments (according to income), rather than government practice of building houses almost exclusively for rent to civil servants or through Improvement Trusts.

Planning the cities and regions in which men live differs from country to country, although there are often more similarities than differences. We know that only differences of degree exist between the more developed countries and the lesser developed countries. But what of the differences between the totalitarian countries and the constitutional democracies: Is the difference between the planning function here only one of degree? To shed light on this question, we include in this issue an extensive abstract of Si Cheng's report of "Town Planning in Communist China, North Korea and Japan - 1945-57," which is based on discussions at the International Union of Architects meeting in Moscow last year. We have been interested to find in this article that a great similarity in outlook on concepts of urban planning seems to exist between the communist east and democratic west, where many of the ideas expressed would seem to have originated. These similarities of forward looking ideas throughout the world are especially evident in the discussion on the optimum sizes of towns, the list of basic principles of city planning and the emphasis laid on tree planting.

This is not to deny the underlying basic differences, for planning in any society owes its existence to that society and to the continuance of the basic social patterns. Perhaps the most obvious instance brought out by this article is the assumption that all workers wish to live adjacent to their place of employment with its implied corollary that (a) they will not change their employment and (b) that all members of their family will work in the same place. Though the easing of costly and time consuming journeys to work is one of the chief preoccupations of urban planning everywhere in the world, experience in non-dictator countries (west and east, "developed" and "under-developed") has shown that freedom of choice of employment - i.e. equal access to alternative sources of employment - seems to be more important to the well-being of the worker and his family than close physical access to a single factory, with its implied economic domination.

An important consideration in planning--and one which will show itself increasingly so--is the effective interplay of physical and national economic planning. It is interesting that the very different planning organizations of Ceylon and Communist China have both taken important steps to effect such an integration of planning activity. Ceylon's modifications of tested western forms of organization seems to show great constructive imagination.

Mechanization is a process which greatly influences our relations with our environment, not least in the actual process of house construction everywhere in the world. We are, in this issue, continuing to include abstracts of Bruce Martin's series of Modular Design Information Sheets, which seem to us to have distilled the essence from the many post-war attempts to bring building practice, industrial manufacture and architectural design together.

The number of people in a country is of vital importance to environmental planning. In underdeveloped countries especially, there is an important need for precise statistics on the potential labor force. John Mars article is particularly significant in pointing up the extent of and reasons for present underenumeration.

EKISTICS is compiled by Yvette and Lawrence Mann under the direction of Prof. J. Tyrwhitt.

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NOTE: The lettering at the top of each page refers to Doxiadis Associates system of classification. The figures below each title refer to the Universal Decimal Classification.

ARCHITECTURE, PLANNING AND EKISTICS

C.A. Doxiadis

Abstract from a lecture series given at the Massachusetts Institute of Technology, Spring, 1957.

1. Last month I terminated by listing four community types (Class I-Class IV) which we found to exist in many cities.

2. After identifying these types, which had certain characteristics in common, we move to the second consideration: factors which will determine the physical sizes of communities.

3. For this we return to the ratio of family incomes to size of house plots: the basic principle being that a given income should correspond to a certain total value of house and land plus community facilities. There are exceptions. For example when a community is of special administrative importance it may possess more that its economic quota of land plus community facilities. The problem of this approach is that while a rational size of plot can be established for middle and higher income groups (including, where necessary, two family houses), it is not possible to proceed in this way for the lowest income groups, as the plot becomes so small it could not support a house.

4. At this stage, therefore, it is necessary to assume that some local or central authority undertake the responsibility of providing subsidies sufficient to close the gap between what can be afforded and what must be considered basic needs. The justification of this is not only on social grounds, but is also economic. The costs of urbanization are great and have to be met from some source. They cannot always be met by the existing generation of urban dwellers because, while usually it is possible for a family to pay for the cost of a house over the period of a generation, it is seldom possible (and in any case unusual) for that same family to meet all the costs of urban land development and installation of community services during the same period.

5. Let us not forget that most people in urban communities all over the world are living on land developed by previous generations. If you walk along the Thames in London you will be walking alongside land which has been developed over five, six or eight generations, and alongside community facilities, such as the subway system, also built by previous generations. Therefore, not only from the social but also from the economic point of view, it is natural and reasonable for subsidies to be provided for the lowest income groups, planned to be recouped not from one but from several generations.

6. We have made numerous studies of plot sizes, usually working with a modulor square of 10' x 10' for ease of comparison. In making studies for the city of Baghdad we used certain sizes of plots which could lead to the development of

houses consisting in plan of a courtyard (patio), verandahs and main rooms. Having established these we studied their combination which would lead us to the costs of the physical formation of a community: an addition of the costs of the plot areas, the house volumes and the costs of their access roads or pedestrian ways. The costs of plots and roads did not vary very greatly between different income groups as the elements composing the houses remained relatively constant. The small increases in higher income communities usually arose from its wider streets, necessary because more vehicular traffic could be expected. The ratio of public access to plot area is higher in the low income areas, because the plots themselves are smaller and because even the smallest house has to have some public access supplied with water pipes and sewerage.

7. Government often leave roads unpaved in low income districts. I have reckoned that it would take 95 years to pave and instal essential community facilities in such areas. In the meantime the district becomes a sea of mud in winter and a desert of dust in summer. This is certainly not a satisfactory architectural solution.

8. If we look back into the past, to see what such people have done for themselves over the centuries, we find that they built much narrower streets, which were for pedestrians only. This made for a better ratio between the private and the public land. These narrow streets were paved - for pedestrians, not for vehicles - by the inhabitants themselves, and the drainage ran down a central gutter, which was unhealthy but better than having no drainage system at all.

9. In the projects we are building in Baghdad, Pakistan and elsewhere we have designed the narrowest possible roads for the lowest income groups (10'), but, in addition, we have also provided a small "gossip square" within each community Class I. Such "gossip squares" become unnecessary in higher income groups, where people have larger houses within which the "gossiping" can take place, or where they have cars and garages and most gossiping takes place outside the narrow bounds of the Class I community.

10. There is another reason for these narrow roads. We have found - as I have mentionned before - that they provide the best conditions of microclimate in that they funnel current of air along them, even on the hottest day when not a breath is stirring. This is because they create shadows and thus differences in temperature which cause constant movement of the air.

11. When we started our work in Baghdad and Pakistan we created several experimental Class I communities: some with their gossip squares in the center and some with them on the corner plots. We are not yet able to determine exactly which is most successful.

Doxiadis, C.A. Architecture, planning and ekistics --3

12. We also experimented with different building materials, house plans, and even different selections of tenants in our endeavour to establish a set of conditions which would lead to social and physical satisfaction and thus create an environment in which we could expect responsible, self-respecting communities to grow up. In the larger communities we found it far more difficult to arrive at satisfactory micro-climate solutions, but we are experimenting with planting dense blocks of trees at strategic points to create shaded areas which we hope may also induce air currents to be set in motion.

13. The problems I have touched on up to now have not really brought out the great battle which is being fought out in our cities between man and the machine. Almost all our cities already existed in the nineteenth century. They were built at a time when man was still the main element. The few horses, carriages and carts were of minor importance to him.

14. The motor car of the twentieth century has brought a new element into the city. If it had been introduced overnight, imported from another planet, we would probably have taken its eruption into our urban world more seriously and have organized the relationship of car to man differently - as indeed we did do with the more specific and easily controlled invasion of the railroads. But this was not so, and we tend to accept the car as a normal element of urban living and have permitted it to mingle with our age-old habit of walking through the streets of the city. It is only lately that some responsible people in the world of transportation have realized the need to separate completely the car from the pedestrian areas of the city by isolating it upon special highways.

15. Can we find no balance between man and the machine? Is it inevitable that these two should always be competitors for space in the city? It seems to me that, even if we cannot find a complete solution, there are some ways in which we can handle this problem.

16. We must first decide which functions of our cities primarily serve man, and which primarily serve the car, and these must then be separated so that areas arise in which there is no cause for dispute. For instance it might easily be agreed that in the Class I communities (10-20 houses) there should be no cars at all. Even if the maximum distance to be covered on foot is put as low as 100 feet in any direction it is possible to implement this suggestion.* Cars would of course enter into the community, but only up to a certain permit. In the rest of the area people would be able to move about freely without ever encountering traffic roads: children to school in the Community Class II and men and women to business and shops in the Community Class III. The cars enter freely from the outside, but never cross these axes.

*200 feet is considered a very reasonable pedestrian distance, even under US conditions (Ed)

Doxiadis, C.A. Architecture, planning and ekistics --4

17. We call a community planned in this way a sea shell - hard on the outside, where it belongs to the machine, and soft on the inside where it belongs to man. It is possible, if we seek it, to find a balance and to create communities corresponding much more to the demands of human life than the communities we find at present around us. At first they may seem unusual but a little consideration will show the advantages. They can allow for a much freer human life within them. They can also allow for cars to be driven at high speeds outside them, slowing down merely for a short distance at the points of entry into the community. In short both a human and an efficient way of living.

18. The corollary of this system is that both the width and the surfacing of roads should be designed for their use: according to the amount of traffic they can be expected to bear.

19. We are now ready to set down the determinants of the formation of a community Class IV - the major units of an urban structure: these are:

1. Social considerations: Composition of the population.
2. Economic considerations: Household incomes, their anticipations and their effects upon the provision of community services.
3. Separation of vehicles and pedestrians.

HOUSING

E.F.O.Q.T.

Bennett, Hubert; Prof. Sir J.L. Martin, and Robert H. Matthew
HOUSING AT PRIORY LANE, ROEHAMPTON, LONDON
Architectural Design, January 1959, Vol. XXIX: 1, pp. 7-21. Illustrations
728.2 (420)

1. This is a description and criticism of Roehampton Lane housing, the largest of the London County Council's recent schemes. Most of the construction is now completed and landscaping is in progress. The Principal Housing Architect for this project is Whitfield Lewis, assisted by K. Campbell (in successsion to Michael Powell). The architect in charge is Colin Lucas and other architects are J.R. Partridge, W.G. Howell, J.A.W. Killick, S.F. Amis, J.R. Galley, and R. Stout. Consulting engineer is W.V. Zinn.

2. The site was the largest of a group acquired by the Council after the war in the Wandsworth area, and the last to be developed. It consists of 100 acres of parkland and gardens. The scheme calls for 70 acres for housing purposes, which is being developed at a density of 100 persons to the acre--the total number of dwellings being close to 2,000.

3. The layout idea of the scheme must be seen in the context of the Council's policy of mixed development. This policy of combining high and low buildings on the same site was firmly established in previous developments. Its essential social idea is that the smaller families are housed in high blocks and the larger families in units nearer the ground, preferably with their own private gardens.

4. The sizes of family units called for in the architect's brief meant that 58% of the accommodation would be in high buildings. This factor, together with a limit of 100 ft. in height for the tall blocks, constituted the major element in the architect's terms of reference.

5. The site is ideally situated with a frontage of nearly a mile on the north side of Richmond Park. A stream, which has now been culverted and replaced by the main spine road following its course, flowed through a valley from one end of the site to the other. To the south of this valley the site rises up gently and falls away into the park. Land exchanges have resulted in a well-contained site. Another factor affecting the layoutdesign is the existence of a well-established shopping centre in Roehampton Village.

6. There are two types of high building used in the layout: 12-storey point blocks and 11-storey slab blocks containing narrow frontage maisonettes. The point blocks are sited in two groups in the undulating, tree-dotted parts ot the site. The 11-storey slab blocks, of which there are five, are sited along the north boundary. The two areas of the point blocks and the one of the slab blocks have a relationship which forms a link of open space, which will create a complex of large scale and give a centre of gravityto the scheme.

7. At an early stage in the design, the scheme was called in for planning consent by the Ministry of Housing and Local Government, in consultating with the Ministry of Works. In these consultation it was decided to orient the five slab

blocks with the living-rooms looking south-east. It was also decided that a link of open space should be left between Richmond Park and the open area around a school to the north.

8. For the main shopping centre, which had been sited next to Roehampton Village, it was decided that this should open out to Roehampton Lane with the main road of the site passing through it. In this shopping centre there will be a 10-storey block of maisonettes and flats with a library and car-park at ground floor level and two 4-storey blocks of maisonettes and flats over shops. Shops will include a Woolworths and a self-service store built for the London Co-operative Society.

9. A subsidiary shopping centre is sited near the hub of the scheme and will cater for more immediate needs. This will have six shops, a doctor's surgery and a public-house and form one side of a piazza, built up on two sides, the other side being held by the frontage of a primary school and a church. A single-storey nursery school is planned to stand freely within the square.

10. Near this subsidiary shopping centre are sited many of the single-storey row-houses for old persons which are designed on a system of staggered party walls, so that they can be sited in between the large trees in this area and can be stepped up on the contours of the site. Their planning suggests a movement towards their club-room with its own Warden's House, which is sited very near to the shopping block and will be in the centre of many of the site activities.

11. The family units in the scheme are planned in narrow-fronted row houses end-onto the site boundary. Between the main shopping centre and the high blocks there are linking rows of four-storey maisonettes which may approach the scale of a Georgian street in London. They will fall in place only when the high block in the main shopping centre is built. At the other side of the shopping centre similar dwellings units have been made up into blocks grouped mainly in squares with private gardens for the ground floor tenants. Here the scale of the development is smaller and there is a closer association with the existing buildings nearby. A site for a new comprehensive high school has been allocated in this area overlooking Richmond Park.

12. The types of dwelling units used were largely influenced by cost limitations. The point block is a twelve-storey building with four flats to a floor symmetrically disposed on either side of a staircase-lift lobby crack. Two bedroom flats look south and there are two 1-bedroom flats looking east and west. This is a more economic arrangement than the 11-storey T-shaped point blocks previously built by the Council at the Ackroydon Estate, where the cost per dwelling was about £2,380 compared to only £2,240 at Roehampton. (The Roehampton dwellings are smaller but include heating, which was not included in the other scheme.) An added amenity at Roehampton is the open ground floor in which tenants' stores and entrance halls are planned. In later buildings, using this type of plan in an 18-storey version with modifications for fire regulations, the cost is £2,640 per dwelling.

13. The 11-storey maisonette blocks are made of units approached by an access gallery and are about 12 ft. wide, each with a large living room and working kitchen on the lower floor and two bedrooms and an internal WC and bathroom on the upper floor. This unit is a more economic one than the 15 ft. 6 in. frontage maisonette with external WC's and bathrooms used at Loughborough Road, where each unit costs £2,455 and no central heating was provided. At Roehampton the unit costs £2,350, including central heating (the installation of which represents 12.5% of the gross cost). Picton Street, which used almost the same number of dwelling units and was designed in a different construction with different finishes, cost £2,103 per dwelling, with central heating not included.

14. Both the high blocks at Roehampton Lane are faced with factory-made precast concrete cladding, having an exposed aggregate finish. The staircase flights have also been factory made. In the reinforced concrete structures only the beams (and in the case of the maisonette blocks, the balconies) were pre-cast on the site. Columns, walls, and floors have been cast in situ. All exposed concrete surfaces have been left as struck from shutters, using carefully matched rough boarding.

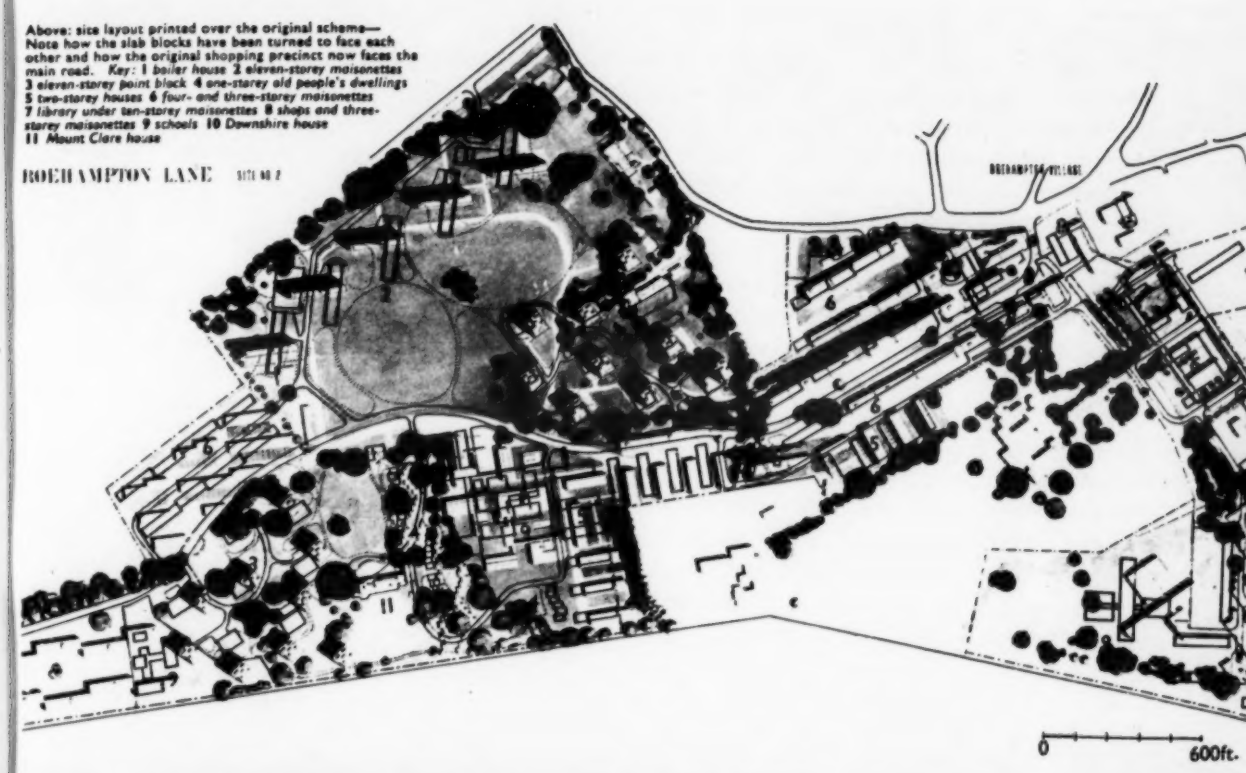
15. The unit used in the 4-storey maisonettes is based on 15 ft. 6 in. frontage and cross wall construction and is one that has been used extensively by the Council, since it is a particularly economical type. It has three bed-rooms on the upper floor and a living room and dining-kitchen on the lower floor. The ground floor maisonettes are planned with walled gardens. On a separate portion of the site approached from Roehampton Lane there are twenty-eight experimental 12 ft. frontage 3-storey houses designed for 'middle income groups.' These have three bedrooms, a living room on the first floor and a large dining-kitchen on the ground floor level opening onto the garden. The 2-storey terrace houses are designed to the same frontage as the 4-storey maisonettes and have four bedrooms, living-room and dining-kitchen; and they are intended for families with four or five children. There is back access to the gardens, as the living-room occupies the full width of the house, and garden stores are designed into the rear garden wall.

16. The single-storey old persons' dwellings contain large bed-sitting rooms in which there is a bed recess and a compactly arranged working kitchen, bathroom and fuel store. They have their own tiny gardens on the entrance side and a sitting-out porch on the living-room side. In addition to the basic types, special maisonette and flat units have been designed for the main shopping blocks in order to suit the frontages required for the shops.

17. The heating system at Roehampton is an important feature of the scheme. It depends on an underground ring main over a mile long taking hot water from a central boiler house to all the high blocks and in addition supplying two schools and some of the communal buildings in this area of the site. It works on an 'equal travel system,' which has advantages in pipe sizings and pump load determinations. Flow temperature is 400°F. and return temperature 140°F. There are separate winter and summer pumps. In the blocks the heating and hot water system is inverse

Architectural Design, January 1959.

Above: site layout printed over the original scheme—Note how the slab blocks have been turned to face each other and how the original shopping precinct now faces the main road. *Key:* 1 *boiler house* 2 *eleven-storey maisonettes* 3 *eleven-storey point block* 4 *one-storey old people's dwellings* 5 *two-storey houses* 6 *four- and three-storey maisonettes* 7 *library under ten-storey maisonettes* 8 *shops and three-storey maisonettes* 9 *schools* 10 *Downshire house* 11 *Mount Clare house*



A row of staggered houses, each one with a private garden on the entrance side

return, seeking to maintain a temperature of 65°F. in the living-rooms and 50°F. in the bedrooms when the outside temperature is 30°F. Hot water in each dwelling is provided by a 30-gallon indirect storage cylinder supplying hot water at 135°F. and served with primary hot water at 160°F. from the pump chamber. Serving over 1,000 dwellings, this is the largest and most comprehensive heating scheme that the Council has adopted on a housing estate. It is very economical for areas of high density.

18. The different types of buildings have been related in scale with one another through the 'Modulor.' Frontages have been standardized to simplify the expansion of the dwelling unit (which is nearly always expressed as a frontage) and the components that make up the infill panels are also standardized and of related dimensions. The two types of high buildings are very closely linked dimensionally with standarized cladding and balcony units, and with (for example) similar living-room windows containing identical components. There is in addition a consistent attitude to detailing. This has helped to overcome the aesthetic problems arising out of the basic difference between these blocks: one is a skin building and the other is a cellular building. The consistency of dimensional ideas has been taken right into the plan of the units and all the detailing in the blocks arises out of it.

Criticism*

19. The importance of Roehampton Lane as a housing estate lies in its expression of a unique relationship of high buildings to a landscape which includes 18th century buildings designed into the whole picture. Although there is a unity of design idea throughout the whole scheme it must be admitted that the low buildings are in a different world from the high and, with the expection of the single-storey old people's dwellings, do not contribute in any new way to any of the major space relationships.

20. A development of this scope and importance cannot be considered only in terms of how well it is done. What are its social implications and what influence, if any, will it have in the future planning of London?

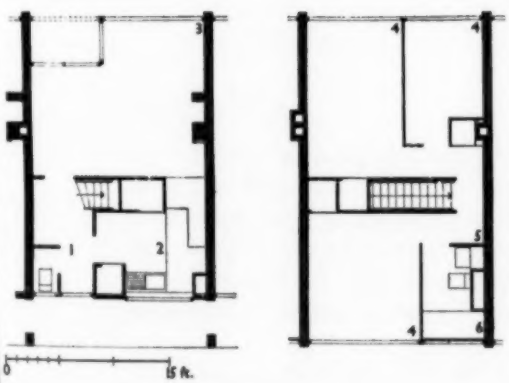
21. The paradox of the 'mixed development' idea of Roehampton Lane is that while mixing the heights of buildings it has effected the segregation of family types into areas or into separate buildings. A cross section of the community therefore only exists at the level of the whole estate. There is no balanced group structure between this level and that of the dwelling unit. Already some of the house dwellers appear to 'look up' socially to those in the point blocks--a reversal of normally accepted values.

22. The formula of mixed development is now well established in Britain. Subsidies have been orientated towards it and it is the theme behind the development of small sites within the existing structure of the large towns. Clustered round the

*This criticism is included in the original article

Architectural Design, January 1959.

General View



Above: lower and upper (right) floor plans of maisonettes
Key: 1 hall 2 kitchen 3 living-room 4 bedrooms
5 landing 6 bathroom

Terrace houses with pedestrian access

one point block like the village round the church spire are the rows of terrace houses or the 4-storey buildings that complete the typical development. The community that is created is directly related to the size of the site and the image of the town becomes one of a series of scattered pyramids of different sizes. It is absurb to think that the accident of the size of a site should be the only determining factor in the structures of a community. Roehampton Lane, the 100-acre parkland site, was probably the last of all the large sites in London capable of being developed at one time. The problem which faces London today is that of redevelopment requiring the co-ordination and reorganization of buildings on smaller sites built on over a period of years. It would be a tragedy if the partial success of Roehampton Lane achieved in spite of its 'mixed development' should cause further schemes to follow its pattern on a smaller scale.

23. The really important thing that Roehampton has done is to point the return of the metropolis scale and this it does in its complex of high blocks disposed in a unified and identifiable relationship. The capacity to design buildings or relate them in scale with the activities and psychological values of the metropolis has been lost in this century. A beehive of multifarious activities is not the answer, when there are no integrating forces to pull a development into the city. We have ceased to plan in conceptual terms, and our architects are forced to work within the framework of a functional diagram: The Town Planner's plan, which very often itself imposes an unforseen architectural image.

24. Needed is a conception embracing the many functions of the city, which is highly meaningful in the values of all concerned. An immediately understandable scale of development is easier with high buildings and open spaces. Maximum choice must be allowed and carefully-spaced lower buildings will need to alternate amont the high building areas. More communal facilities will be needed. But most of all there is a need for really comprehensive development--which Roehampton Lane is not.

B.E.Q.

Newcombe, Vernon Z.
HOUSING POLICIES AND STANDARDS IN MALAYA
Housing Review 8: 2, March-April 1959, pp. 50-56. Illustrations.
333.332.6 (59)

1. This paper was prepared from a talk given by Mr. Newcombe at the Housing Centre, London, during December 1958. Vernon Newcombe has written widely on housing problems in Malaya (e.g. EKISTICS HIB-GA 31 - April 1958, pp. 174-176) and in other countries.

2. Malaya, a federation of 11 states, became an independent country in 1957. The country has an area of about 51,000 sq. miles (a little less than England and Wales together). It is situated on a narrow peninsula a few degrees from the equator. The climate is wet tropical. The population is 6.3 million, only about half of which are Malay--the rest mainly Chinese (40%) and Indian (10%). In the urban areas only about 15% of the population is Malay. The economy is highly vulnerable to fluctuations in world prices of rubber and tin. It is so far not been possible to set aside sufficient funds for the housing sector to ensure the necessary steady rhythm of a long term housing program.

The Housing Problem

3. It is estimated that the population is growing by natural increase at 2.5% to 3% per annum, and there is a great deal of rural-urban migration. The disproportionate increase of the urban population caused two sets of housing problems: growth of squatter areas, and increase in overcrowding of the shophouses.

a. In Kuala Lumpur, the federal capital, 1/3 of the population (about 100,000 persons or 20,000 families) live in squatter areas in a jumble of primitive huts without proper layout, roads and sanitation.

b. The overcrowded shophouses are even worse from the health point since families are living there in cubicles of 100 sq. ft., many without direct access to external air and light. This has led to exorbitant rents, with such a cubicle costing as much as M$30 (where M$1 = $0.33 U.S.).

Housing Policy

4. Public housing was not given consideration in the Federation of Malaya until after the War, and it was not until 1950 that the Federal Housing Trust was established and given fairly wide powers for compulsory acquisition of land and the carrying out of slum clearance and redevelopment scheme. The Trust was endowed with an operating fund of M$10 million and began to establish its own administrative and technical staff in 1953.

5. Houses for Sale. With very little housing being constructed in the country--and that at vastly inflated prices--it was decided to devote the first stage of the programme to ownership housing for the middle income (M$300-M$900) groups.

Demand for such housing was established by a series of exhibitions of house models in the more important urban centres and by abstracting from 10,000 application forms submitted at the exhibitions. Eventually more than 1,000 houses were built and sold successfully. The selling prices were based on actual cost of land services and buildings plus interest charges and cost of administration and supervision. The only profit involved was that in the building contractor's quotations. The cost of a typical sales house is given as M$10,620, including M$950 for land cost, M$1,500 for development, M$7,000 for building and the remainder for interest, contingencies, administration and supervision.

6. The Trust insisted on recovering the whole of the purchase price upon completion and sale of a house. This meant that most of the purchasers had to finance their homes through 15-18 year loans obtained from a Building Society which was established by the Colonial Development Corporation. The Building Society was an essential factor in the realisation of the home ownership program; and the Federal Government encouraged its activities by investing additional funds and by partially guaranteeing loans, enabling the Society to make loans of 90% of the house valuation. Arrangements between the Society and the Trust allowed rapid turnover of capital.

7. A limited number of houses were built, but the work of the Trust was far more effective in stimulating large scale construction by private speculative builders. Designs, layouts and selling prices were influenced by the Trust's examples. All borrowers from the Building Society increased from 300 in 1954 to 2,000 in 1957. The development of a new town near Kuala Lumpur was also initiated by the Trust. The Federal town planner prepared the plans and the Trust built the first group of 160 houses in 1954; but private enterprise has now built 3,000 additional houses, following the plan and the examples. Since 1956, the Trust has left the provision of middle-income housing to private enterprise, and it has turned its attention to low income housing (for incomes of M$100 to M$300 per month.). There are two sets of policy for such housing and government aid is provided.

8. Rent Purchase Housing. Monthly rent paid by the occupier is recorded as a hire purchase instalment. The occupier does not pay an initial deposit and he becomes the owner of the house as soon as the cost of the building and ancillary services is repaid. The administration of housing schemes of this type is the responsibility of the local authorities, to whom the necessary construction funds are granted in the form of Federal loans, with the Trust acting as agent. Loans are normally for ten-year repayment at a subsidised 2% interest per annum. Maximum monthly repayment of capital plus interest is M$35, which means that the inclusive cost of each unit cannot exceed M$3,500. Experience has shown that no more than 1/7 of the income of the lower section and 1/6 for the upper section of the low income range can be expected for regular payments. This policy is implemented mainly by the construction of timber houses in rural areas and on the urban fringe. It is intended to be a contribution to the general policy of retarding rural-urban migration and of opening up new agricultural areas to provide work for the growing population.

Fig. 3. Rent purchase housing: timber houses in semi-prefabricated construction.

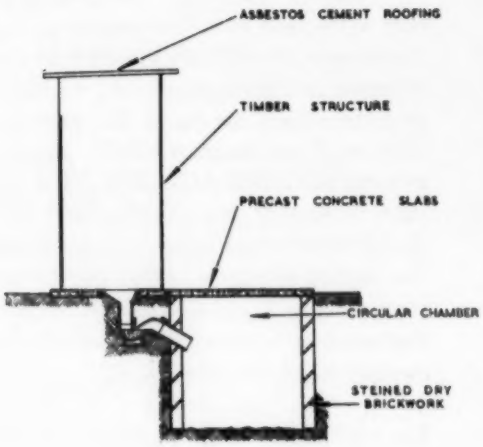


Fig. 5. Rent purchase housing: Pour flush latrine suitable for low density housing in rural areas.

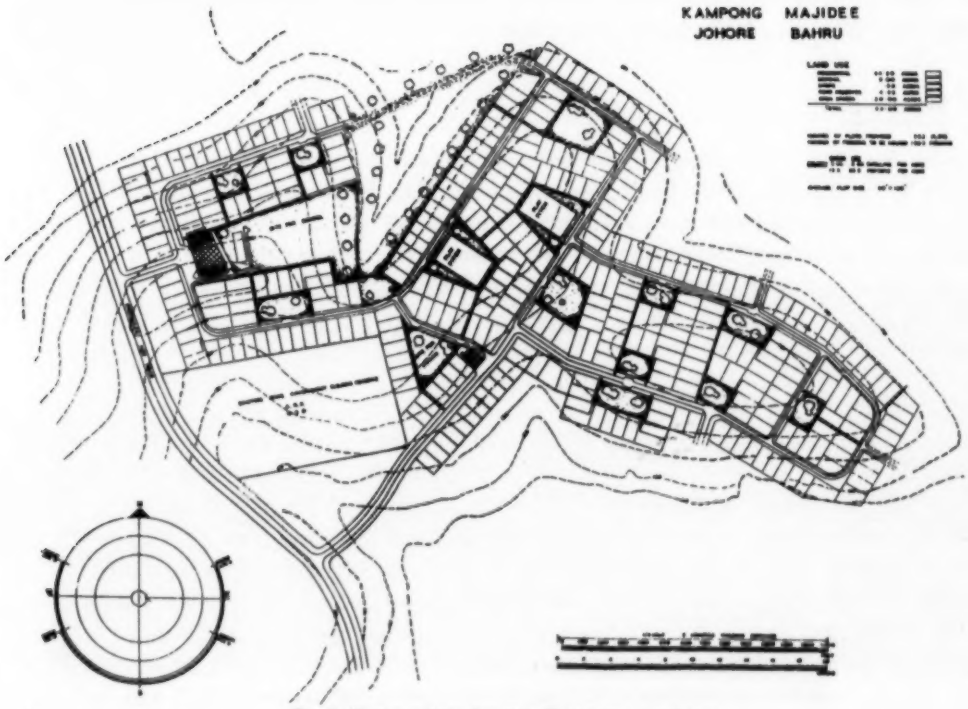


Fig. 4. Rent purchase housing: Estate in a rural area.

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9. Rental Housing. The occupier remains always a tenant and pays an inclusive rent sufficient to cover repayment of capital cost, interest, fire insurance, assessment rates, maintenance and administration. The administration of rental schemes is the responsibility of local authorities, to whom are granted construction loans for up to 30 years and subject to 5% interest. Monthly inclusive rents must not exceed M$50, which means that the cost of each unit cannot exceed M$5,000-M$6,000. The local authority becomes the owner after the loan is repaid; and any surplus from rents thereafter must be used for the provision of more housing. Here also the rent should not exceed 1/7 to 1/6 of the tenant's income. This policy is being implemented by the provision of high density housing schemes in permanent construction in the urban areas. It is designed to facilitate the clearing up of squatter housing and to alleviate the overcrowding in shophouses.

10. Subsidies. Besides the Federal subsidy for lowering interest rates on rent purchase and rental housing, the State government in their turn are expected to provide indirect subsidies by making State land available either free of charge or at nominal charges. They may also provide free roads and water mains to assist the rural population.

11. Design and Construction. A few of the larger local authorities make themselves responsible for design and organization of construction of low cost housing. Most, however, call in the Housing Trust as their technical adviser and agent.

Housing Standards

12. Houses for Sale. Customers' preferences have to be studied carefully if sales are to be quickly and efficiently effected. The first major scheme designed and constructed was an estate consisting of 160 houses at Petaling Jaya. It included a large proportion of two-storey houses arranged in rows of 5 to 6 houses grouped round a children's playground. The resulting density was 9 houses to the acre. Following popular demand, similar two-storey houses were arranged at a later scheme as detached houses linked by stores and garages. As a result the density dropped to 6.5 houses to the acre. All estates include a substantial proportion of bungalows which makes the achievement of higher and more economical densities practically impossible.

13. Road widths are laid down by Town Council bylaws and more or less follow British practice. Savings were effected by introduction of footpath access to the smaller houses. Bylaws in many areas insist on a minimum distance of 80 ft. between building frontages. Road and sewerage specifications have to be agreed with Town Councils, who take over these works on completion. Most Town Council bylaws require a minimum room size of 120 sq. ft. and of 70 sq. ft. for kitchens. Room heights were often required to be 10 ft. and even 12 ft., but in most instances a heights of 9 ft. is now permitted.

Housing Review, March-April, 1959.

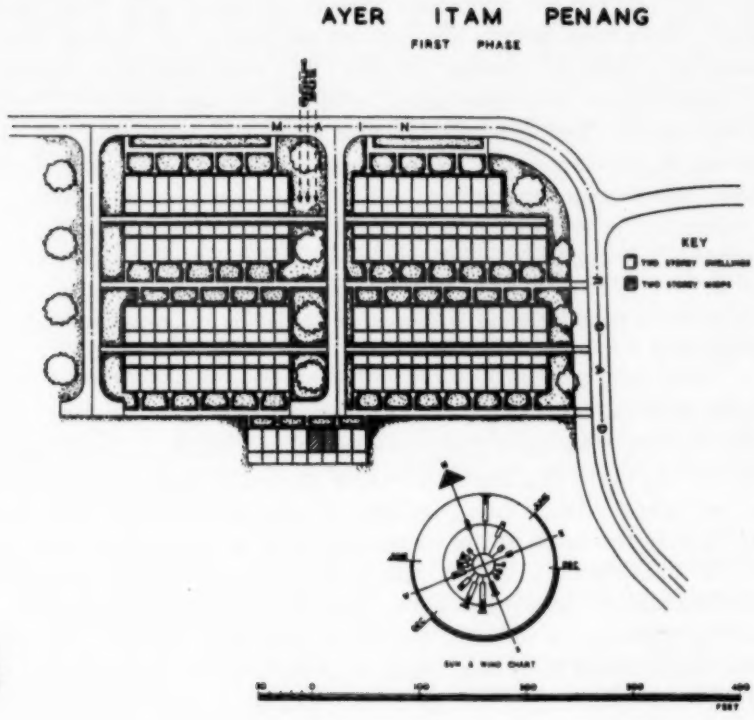

Fig. 6. Rental housing: High density estate on the outskirts of Penang (20 *houses per acre*).

Fig. 7. Rental housing: High density estate on the outskirts of Penang.

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14. All households are large by Western standards (or potentially large in the case of young families) but the purchasers' choice of house types is entirely dictated by his purse. House type designs are thus not related to any demographic statistics, but consist of a range of cheaper (smaller) and more expensive (larger) houses. One of the smaller houses had three rooms, kitchen, shower and W.C. with a total floor area of 495 sq. ft. The cost of this house excluding site works was M$4,000 (about M$8 per sq. ft. of floor area). The largest houses had six rooms, kitchen, two bathrooms, one shower and garage with a total floor area of 1,570 sq. ft. Houses of this type had better finishes (e.g. terrazzo floor tiles on the ground floor and electric hot water heaters). The cost excluding site works was M$14,000 (about M$9 per sq. ft. of floor area). All houses were constructed in brickwork after the results of a small pilot scheme in pre-cast concrete construction had been discouraging.

15. Much care was taken to design houses suitable for the humid tropical climate. Wherever possible they were sited with the longer walls, containing most of the windows, facing north and south to ensure maximum shading by comparatively small projections. Also, when possible, at least one through room was provided from the front to the back of the house to ensure in conjuction with louvres free movement of cooling air currents. Large overhanging eaves, canopies and low lintols and transomes were provided to give protection from sky glare. Even so, the resulting appearance was still similar to European houses. This seems unavoidable where there is no real local architecture and European architects are working with European-type materials in a European inspired urban setting. Superficial application of local ornament or the clichés of Brazilian tropical architecture are no solution either.

16. Rent Purchase Housing. This presents a greater challange to the designer since such housing is designed to serve the rural population. He has to plan for people whose cash income is in the lowest range; and he is bound to find a local building tradition which must not and cannot be ignored, since rural people are likely to be the most conservative as regards customs and tastes. Foreign imports, however cheap, are likely to fail if they do not conform with local traditions. At the same time rural people near urban areas may associate western house design with progress, and may prefer it on these grounds. Timber and bamboo, which are in almost unlimited supply, have been the construction materials for rural dwellings since ancient times. In some areas there is a very high standard design tradition. The new range of house types was designed for timber construction. To employ the less experienced rural craftsmen and with aided-self-help schemes in mind, the range of houses was based on a system of construction suitable for pre-fabrication at the site or in nearby sawmills. In a few locations, tanalising plants are available where timber can be pressure impregnated with proprietary salts.

17. Again house sizes have to be related to the purchaser's income rather than to the size of his family. Rent purchase houses designed so far vary from one-room houses with a floor area of 340 sq. ft. (cost excluding site works M$1,600)

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to four-room houses with a floor area of 680 sq. ft. (cost excluding site works M$3,000). The average cost per sq. ft. is about M$4.50 The layout density is usually as low as three or even two houses to the acre. Suggestions to group the houses more tightly, for economies in roads and water mains and to provide remaining land as allotments, have so far not met with approval. Normally roads are of simple earth construction and water supply is by standpipes at the rate of one standpipe for twenty houses.

18. Sanitation relies normally on bucket latrines, but the cost of servicing these is high because of the increasing scarcity of labour willing to do this work. Other forms of sanitation have been tried out. One was the bore hole latrine, but there appears to be no practical way to seal the top of these effectively to prevent the breeding of flies. Another is the pour flush latrine which seems more appropriate because it provides a water seal and because the Malay (Muslim) population is in the habit of using water in this connection. (But this system could not be used for the Chinese population.) A complete pour flush latrine can be built for M$160 which represents an amortisation charge of only M$1.60 per month on a ten-year repayment basis of 2% interest.

19. Rental Housing. The policy is to site rental housing schemes on State land, which is now in very short supply in urban areas. Layout densities are based on this consideration, coupled with the necessity to reduce the cost of roads and services per unit to a minimum while preserving minimum acceptable standards of natural ventilation and lighting. Thus density is not based on a pre-conceived idea but is ascertained after completion of the design merely as a check and as a guide for the overall planning of the areas as a whole. The same kind of practice in Hong Kong has densities of 2,000 to 3,000 per acre justified by local conditions.

20. Schemes carried out so far provide one- and two-storey row housing at 20 to 30 houses per acre or about 100 to 150 persons per acre. A scheme in the inner area of Kuala Lumpur consists of a 1 four-storey and 2 twelve-storey blocks of flats and provides about 110 flats per acre or about 550 persons per acre. Houses (about M$6 per sq. ft.) are cheaper to construct than flats (up to M$15 per sq. ft.) and are preferred by tenants. A compromise solution are two-storey flats where the upstairs flat can be given a separate entrance and its own yard at ground level. These can be laid out at 40 units to the acre or about 200 persons per acre.

21. Terraces can usually be laid out facing north and south with walls and windows shaded by the projecting eaves at midday. The prevailing breezes in Malaya are usually from north to south and from south to north. In view of research which has been carried out on the subject (at the Engineering Experiment Station in Texas), it seems unlikely that under these circumstances closely packed two-storey terrace houses will benefit from natural draughts. To overcome this deficiency to some extent, 'breeze streets' are arranged wherever possible. These run in the direction of the prevailing breezes at right angles to the terraces. They are made wider than demanded by the bylaws, the carriageways are pushed over to one side

and the wider verges thus obtained are planted with trees. Thus the population can meet and discourse in an air-cooled and shaded area.

22. The arrangement of house type plans follows a low cost housing code originally evolved in Singapore. It permits 8 ft. ceiling heights and specifies minimum room sizes as follows:

Living room/dining room	140 sq. ft.
--(if not cross ventilated)	160 "
First bedroom	140 "
Second "	120 "
Third "	70 "
Fourth "	120 "
Kitchen	70 "

23. In determining the size of the individual unit it is usually necessary to start with the rent future tenants can afford and to design something which fits into the budget thus established. The smallest unit designed is a one-room flat with a floor area of 250 sq. ft.; and the largest is a two-storey four-room terrace house of 610 sq. ft. It is quite likely that even the one-room unit will be occupied by families. (In Hong Kong 120 sq. ft. units designed for five persons have been found acceptable to meet extreme pressure for shelter.)

24. In spite of the housing shortage and appalling slum conditions, some tenants may be reluctant to take up even the most attractive new accommodation offered. This has been the experience in other territories also. The slums are close to where the tenant is accustomed to find his livelihood. The new area may be removed from his customary place of work and may involve him in transport costs. There may be no schools available in the new area for his children. Surveys have shown that among all desirable things, education figures highest in the minds of the people of Malaya.

PLANNING

D.G.I.O.W.

Si-Cheng, Liang
TOWN PLANNING IN COMMUNIST CHINA, NORTH KOREA AND JAPAN --1945-57.
International Union of Architects, Fifth Congress, Moscow, July 1958. Theme I, "The Plan: its functional and aesthetic aspects," Report titled "Construction and Reconstruction of Towns in West Asia 1945-1957.") Congress Papers, Moscow, 1958.
711.16 (51) (519) (52)

1. This report is one of the first to come into our hands which describes first hand much of the planning work in the People's Republic of China, and the People's Democratic Republic of Korea. It is interesting additionally in that it provides a comparison (from one point of view) with the planning in Japan, where Western influence have been more direct. Liang Si-Cheng is Vice President of the Architectural Society and a Member of the Academy in the People's Republic of China. As Rapporteur, he prepared this paper, which summarizes this section of the Congress.

Introduction

2. In the 12 years since the war, great changes have taken place in Asia. One country after another has become independent and begun work toward economic reconstruction. Many new cities have appeared. In communist China, during the period of the 1st Five-Year Plan (1953-57), 38 new towns were built and 54 cities were expanded and redeveloped on a large scale. In India new towns appear one after the other as she develops her rich natural resources. In North Korea dozens of new towns are in the process of being planned and constructed. In Japan, Hiroshima and Nagasaki, as well as many other towns, are being rebuilt. Similar achievements are found throughout South East Asia, where in recent years the construction, reconstruction and redevelopment of towns and cities have become problems of great importance.

3. In the process of building their cities, the countries of East Asia are confronted with a number of problems that are similar in nature. With very rare exceptions, the Asiatic countries have been long under the rule of colonialism or feudalism. High population, scanty arable land, backward economy, low standards of living, etc. are their common characteristics. Such characteristics will have their effects on the construction of cities, effecting certain particular conceptions and methods different from those of European and American countries. More concrete problems are better understood in the light of these characteristics of Asian countries. A peaceful climate is needed for the development of Asian towns and industry.

Problems Common to All Types of Cities

4. City Planning, Regional Planning & the National Plan. Japan is the most urbanized country in Asia and is thus a convenient starting point for discussion. After 12 years, the Japanese economy has recovered to its pre-war level. Greater

reliance on natural resources and trade has made regional planning important. The Coordinated National Development Ordnance of 1951 provided for regional planning in 19 regions, and much has been done in these regions. There is a general plan of the Central Economic Planning Bureau, and local plans have been prepared by individual prefectures. But the Japanese architects report difficulties:

> "Although towns located in such areas are being planned to meet future demands as to sizes and characters, conflicting administrations on the part of the central Transportation, Construction, Trade and Industry, and Agricultural Ministries limit the realization of such plans. Political, financial and technical limitations on the part of regional administration also restrict their realizations. Therefore, much is to be expected in the future to establish a firm relationship between town planning and regional and national planning."

5. These are common expectations of city planners. But in North Korea and Communist China, as well as in many advanced countries, city planning and regional planning are the continuation and realization of the national economic plan. In tempo with the planned economy and national construction, the work of city planning is pushed forward. For example, great progress in repairing Pengniang, North Korea and forty other cities and towns in that country was planned, approved and largely carried out very quickly.

6. In Communist China, 156 towns and cities have been planned during the past five years; and these gigantic tasks are the reflection of the national economic and construction plan. In North Korea and in Communist China city and regional planning are performed with the national plan as their basis. The correlations of the three have become closer and closer.

7. Mainland China's work in city planning was started in 1949, but regional planning came later. Yet regional problems were considered in city planning before the regional plans came into being. For example, the National Construction Committee organized the "mixed work-team for industrial site selection" to include members from the administrations of urban and industrial construction. This was to assure that in each district all the industries, settlements, water supply, power stations, transportation, etc. built at one time would be well coordinated. This prevented random scattering of industries and blindfolded urban development.

8. With the realization of the First 5-Year Plan, industry and agriculture developed rapidly. For more national distribution and better coordination and teamwork between industry, agriculture and communication and transport, it was felt that regional planning was even more important; and instructions for work on regional planning were given by the government in 1956. By 1957 work on the plans for 10 regions were started and showed immediate advantages to city planning, especially for medium and small cities. Problems such as town character, size, development direction, etc. were decided. Definite points of emphasis and order of precedence marked

these plans. First consideration was the distribution of industries, which determine the location, character, size and the steps to be taken in the construction of a town and the effective guidance of its proper development.

9. The working out of the regional plan in many cases brings about modifications of the national policy--thus better fitting the national plan to local conditions. Regional planning is a positive impetus to city planning, and the policy in Communist China is to push it forward and strengthen it. This will enable the workers in city planning to proceed with their work with the maximum possible accuracy and speed.

10. The Question of Optimum Size of City Population. On the basis of the view that a metropolis with excessively concentrated population is undesirable, many countries are taking measures to restrict further growth of great cities. The report from the Japanese Section at the Congress indicates such efforts, and decisions on this topic are being reached in Communist China concerning some of the very large cities. For example, the maximum allowable population size for Shanghai has been set at 7 millions.

11. The planned economy in Communist China allows for implementation of decisions on city size in terms of both national economy and the specific, concrete conditions in individual cities--reached through definite plans. It is the Rapporteur's own opinion that the number and distribution of towns should aim at the appropriate ratio of cities of large, medium and small sizes, with the majority of them medium and small sized towns. There are different national ideas about what constitutes a "big" or a "small" town. In Communist China it is generally accepted that communities having less than 50,000 will be called "settlements." Towns and cities of between 200,000 and 500,000 are defined as "medium sized." In Mainland China, with its 650 millions, a certain number of large cities is both appropriate and necessary. Certain cities have to function as the centers of centralized industries in the national plan, and these will develop to a large size. Several provinces in China have populations well over ten millions; and the political, economic and cultural center of such provinces can well have populations over half a million. But limits should not be overlooked even for such cities--as a means of ensuring normal development and preventing overgrowth.

12. The average new towns are to be either medium or small (from perhaps 25,000 to no more than 300,000 inhabitants). The reasons for this policy are:

a. Such population limits of towns will be favourable to the balanced distribution of productive forces, thus shunning the possible excessive concentrations in the distribution of industries. Moreover, an average medium or small size town is capable of accommodating one or several large-scale industries and it is possible to build up the industries with the best correlations and economy.

b. In medium and small cities, there will be more accessibility to nature, and conditions for health will be better. Traffic problems can be easily solved. It will also be possible to relax some tenseness in the supply of consumer commodities sometimes found in large cities.

c. Investment and maintenance of dwellings, communal services and public works will be lower than those of big cities. These economies must be carefully considered while the country is concentrating on industrialization.

13. But the population size of a city should not be excessively suppressed except for certain particular purposes. Such excessive size suppression is desirable neither from the point of view of fitness to the national economy or of the possibilities of creating environments for the material and cultural life of the inhabitants. Complete facilities for a single plant are uneconomical to build up and maintain; and in the same way, building hospitals, theatres, etc. for a very small number of people is not permissible.

14. The City Structure. The basic principles of city planning are different in countries with different social systems. In the opinion of the Rapporteur, a real city plan is for the welfare of the great mass of people, and its function is to give assurance to the prospective raising of the material and cultural standards of life for the masses. A city plan must abide by these principles:

a. It must give assurance to the possible development of the city in accordance with the development plan of the country's economy.

b. It must create favourable conditions to ensure the development of productive activities of industrial enterprises and communities and transport.

c. It must ensure the creation of favourable conditions for work and life of the inhabitants.

d. Appropriate distribution of residences, public buildings, amenities and public utilities so as to facilitate the gradual raising of material and cultural standards of living of the inhabitants on the basis of and in pace with the development of national economy.

e. The city, as a whole or as parts, should be treated as an architectural entity, so that the city will appear as an integral whole architecturally.

f. The entire city and its periphery should be planned with a system of green areas and green belts to give the best possible healthy conditions to the inhabitants.

g. Agricultural districts should be laid out in the outskirts of the city so as to ensure the constant daily supply of fresh vegetables, fruits, meat, milk, etc.

h. Measures of safety and fire prevention must be taken into considerations.

15. To ensure the appropriate distribution of all physical elements in the city and the best economic use of every piece of city land, functional zoning must meet the above requirements. The most important principle in zoning is to ensure the creation of favourable conditions for production activities while at the same time to create convenient, comfortable and healthy living environments for the masses. This is the double purpose of "facility to production" and "convenience to the people." The zoning plan of Pengniang, North Korea is given as a example. While having in mind the future development of a city, the planning of a city's zoning must not overlook present conditions. It is often unrealistic to disregard the functional zoning that historical forces have shaped, but neglect of future developments (and the reservation of land for the direction and scope of future expansion) will lead to functional chaos in a city. The city planners of Communist China consider this point (i.e. the requirement of flexibility) especially important. Planning for new industrial and residential districts of Hangzhou provides an example.

16. There are questions as to whether it is desirable to have urban districts particularly reserved for commerce, administration, education and culture, etc. It is the opinion of the Rapporteur that the functions of commerce and other institutions of public facilities are to render services to the great masses of people. Thus they should be evenly spread over the entire urbanized districts. Except for certain special stores of total-city nature, there is no need to crowd an excesssive number of stores into the city center forming a concentrated commercial district and adding to traffic congestion. Some dispersal of office buildings will make the proximity between work and residence possible. In Peking, many administrative office buildings are built with their residential quarters in the "blocks" behind them, and this seems quite reasonable. In some Chinese cities several institutions of higher education and scientific research are concentrated into one area. While there may be certain advantages to this arrangement, the coercion of all institutions into one confined area (especially those that would be better located in the residential area or those which would be better located near industrial plants for easy laboratory practice) and the creation of specialized educational and cultural districts may not always be the most desirable solution.

17. The most important interrelation between the city areas is that between the areas of work and those of residence. Traffic between them is the most regular and constant and of the greatest volume. Thus is the planning of zoning, primary efforts should be made to minimize the passenger traffic of daily employment and to realize in the immediate future residences within walking distances of their

occupants' places of work. Many new towns in Mainland China have made great efforts in this direction. In big cities, further consideration should be given to the balanced distribution of working and residential areas in different parts of the city--especially when the terrain is cut up by natural or man-made obstables. The general plan of Lanzhou shows the city to be long and narrow in shape: It is composed of a number of patches of terraces cut up by the river and hilly ridges. Thus in the zoning of Lanzhou, the balance of functions in different parts of the city had to be considered.

18. Work. The report of the Chinese Section of the Congress states that the allocation of industries in a city should be based primarily on considerations of coordination of production, communication and transportation, natural environments, conditions in view of health, etc.; and it is under consideration of these factors that an overall allocation should be made. All city inhabitants want to minimize the distances between places of work and residence,* and this suggests that an excessive concentration in one area of a city is undesirable. In the bigger cities of Mainland China, North Korea and Japan there are usually two or more industrial areas in one city. There are 4 in Lanzhou and three in Hangzhou, and such arrangements are considered appropriate. But of course, the size of each such industrial area should be such that a combination of mutually correlated industries may be given conditions to cooperate properly and to share in the construction and use of railway lines and stations, power stations, water supply system and other facilities and services. Handicraft shops may be allowed to locate near or even in residential blocks. In Communist China and Korea there are codes specifying the required distance between industrial and residential areas. But some of these standards are too high, and the present tendency is to lower those ill-suited to current conditions and to allow some freedom to the planner in their application.

19. Living. About half of the world's population lives in East Asia, but the proportion of dwellings is much smaller. Statistics of India in 1952 indicate that the average room of 10 feet square housed five adults. In North Korea the average living space per capita was in 1955 only 1.8 to 2.2 M^2. In Mainland China some of the old medium or small cities have average living space of 6 to 9 M^2; but a survey of 175 cities in 1957 showed that the average living space per capita is only 3.5 M^2. The housing problem is acute in other countries also. The housing problem in East Asia is that of easing off the very acute shortage, and the question of high or low standards is secondary. The criterion for the construction of dwellings then is: large number, low cost, high speed. In Korea dwellings totalling 13 million M^2 of floor area have been built since the war. In Communist China, urban dwellings financed under the First 5-Year Plan amounted 80 million M^2 in floor area. Japanese housing is built mostly with private capital,

*Editor's note: But there is much evidence that, given choice and means, many people do not want to minimize the distance between home and work.

with government subsidies or loans; but the shortage of government funds has seen the annual erection of dwellings lagging below demand. Housing developments in East Asia generally expand laterally, and most dwellings are of one or two storeys (except in a few big cities where many dwellings are at three to five storeys). Architects have made noble efforts in designing standardized plans for low-cost housing. In Korea, a living area of 15 M^2 per family is standard for temporary dwellings. In Mainland China suites of 1, 1.5 and 2 rooms are in use, and these have living areas (bedrooms and living rooms) of 9, 12 and 15 M^2 respectively. A housing unit in Japan generally consists of 2 or 3 bedrooms and sometimes a living room.

20. Because of high population and low acreage of arable land, high densities of living space allotment, under permissible hygenic requirements, are found necessary in East Asia. In Communist China the 1-2 storeyed blocks recently built in cities have immediate average population densities of 500-600 per hectare (i.e. 200-230 per acre); and in blocks of 3-5 storeys, 1,000 persons per hectare is permitted (i.e. 400 per acre). Views of the principles of organizing residential districts are much the same in Japan and in Communist China and Korea. A community unit should be organized around one or several elementary schools as well as a system of facilities intimately associated with the everyday life of the inhabitants. A number of such community units will form a residential district. In China and Korea, a number of residential districts have been built in accordance with this principle in recent years. The aspirations of Japanese architects have been delayed by social and financial problems. Most houses in Japan are of wood, and precautions against the spread of fire must be taken. City planners in that country thus resort to isolation of individual residential areas by the use of rivers or green belts as boundaries or by using fire resistant construction along arterial roads. Speed of construction is the most hopeful sign in East Asia's efforts in housing.

21. Parks and Verdure. Great attention has been given to urban verdure in Communist China. In the new city of Leyang, more than 3 million trees have been planted in the past 3 years. Replanting of old parks and the creation of new ones is common in many cities. In 1956 the government issued the slogan: "Make the whole country green in 12 years," followed by a popular movement "Everybody's sleeves up; Plant trees on all the 'Four Sides' (house sides, village sides, road sides, water sides); Make the countryside green; Make the town green; Make the whole country green." In March and April, 1958, a mass planting drive was launched all over the country and in all cities. Many provinces have already announced their plans to verdurize the entire province during the next five years. Nearly every town and city set as their goal the verdurizing of their urban area in one year, and the suburbs in two or three years. Their slogan is: "Make every bit of land green--totally Green! Spare not an inch or ground. Where you can't plant a tree, plant grass."

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22. The plan of the municipality of Shanghai is to plant 120 million trees in 1958, to make the entire city green, colourful and fragrant within 3 years, to become a wooded garden city in five years, and to be self-sufficient in the supply of fresh fruits in ten years.

23. In reforestation, a mountain village in Shansi Province became national champion with an average of 4,000 trees per person planted in the winter-spring of 1957-58. By April 15, 1958 statistics reported that 18 million hectares had been reforested in 21 provinces, and this was 421% of the 1958 goal. In 13 of the provinces and in Peking, an additional 10.8 billion trees had been planted on the "four sides." It is expected that the national verdurization plan, when realized, will greatly affect the climate, as well as health conditions. With wind-carried sand and dust minimized, cleanliness, healthfulness, freshness and beauty will appear.

24. As a result of the policy of "all out planting and over all green," the policy in the planning of urban green spaces tends towards a spreading out and an even distribution. Home gardens, community greens, green city squares, roadside trees, green belts, public parks of various sizes and stretches of suburban woods will all be combined into an integral green system--providing places of rest and leisure throughout. The norm for green spaces will be varied according to conditions in each city. No agricultural land can be violated; and city green areas will be given maximum expansion. The quota of 6-14 M^2 of green space per person originally set by Chinese planning authorities will soon lose its practical significance.

25. The Congress report from the Korean Section indicates that urban green spaces in North Korea are classified into parks and culture and rest, regional parks, small playgrounds, street gardens, sidewalk trees, etc. These are integrated to form a green space system of a city. The norm for green spaces in city planning is over 15 M^2 in major cities, 10 M^2 in medium size cities, and 7 M^2 in small towns per head of population.*

26. In Japan green spaces are classified into two main categories:

a. Park and reservation facilities plus sport grounds and cemetaries, and

b. Green belt zones

The latter category has been included in the planning of only 11 larger cities. The norm for park and reservation facilities is over 6 M^2 per person of the

* A common US standard is 10 acre per 1,000 population and a common British city standard is 5 acres per 1,000 population = approx. 43 and 22 M^2 per head respectively.

metropolitan population, and of these facilities 3 M^2 per person living in the town is planned within the town district. Some green belt zones of more than a kilometer in width are being planned on the periphery of or within the cities, with joining radial belts from the central area of the cities.

27. Public Buildings. The need in most countries of East Asia at present, with regard to public buildings, lies in facilities and services that afford convenience to the everyday life of the people. In Communist China the Government has appropriated large sums of money for the construction of urban nurseries, kindergardens, schools, hospitals, cinemas, theatres, shops and stores, administrative and other public buildings. More than 80 million M^2 of public buildings were constructed under the First 5-Year Plan. Since the national economy is being put on a planned basis, the construction program can have a planned ratio in the appropriation of public buildings by function. In the First 5-Year Plan, this was considered as the problem of 'Bone vs. Meat,' where industry, communication and transportation, etc. were considered 'bone' and housing, buildings for amenities and services, public works, etc. were 'meat.' The most appropriate ratio for capital construction appropriations between the two categories was sought and was in this case determined at 77% for 'bone' and 23% for 'meat.' The allocation of various kinds of public buildings in a Mainland Chinese city is administered according to the appropriation in the construction budget of the national plan and in the general plan of the city. The aim is convenience and service to the people, and the trend is toward decentralization and an even distribution. The norm for public buildingsis highly complicated and a government draft of "Norms for City Planning" issued in 1955 has been subject to constant revision. Local conditions must be most carefully considered here.

28. The distribution of public buildings in Japan still fails to abide by the intention of the city plans. Japanese planners have tried to use the school districts as community units and to provide such public welfare facilities as kindergardens, nurseries, parks and assembly halls accordingly. But the areas and population of school districts are determined by greatly complicated social conditions, and sufficient facilities are not provided for financial reasons. Such distribution standards are actually realized more frequently in new large scale housing developments. There is also a problem of finding sites for crematories, stock yards, incineration and sewage treatment facilities planned in suburban districts--because of opposition by nearby residents. There has been a recent attempt to hold down the number of stores in community establishments to 3-10% of the total unit housing, but this has not yet been realized. Japanese planners have also taken measures to concentrate administrative functions in a single building, located at a convenient and scenic site. Finally the installation of common facilities of economical scale for use by several cities is the trend for small to middle size cities.

Si-Cheng, Liang. Town planning in Communist China, North Korea... --9

29. Transport. Transportation in Asia is still very unevenly developed. The situation in Japan is very much like that of certain big cities of the West: concentration of automobiles in central areas, congestion, shortage of parking space, slowed speeds, accidents. Underground and elevated solutions have been sought, but these are not cures--and they are expensive. Rapid transit isused for both inter- and intra-town traffic with the tendency for trains, electric cars, and buses to complement each other in service.

30. But in most other countries of East Asia, the situation is quite different from that in Japan. Generally, the types of vehicles used are varied: besides motor vehicles, there are a large number of bicycles and animal-drawn vehicles. These conditions will not change at once, and this complicates the traffic problem. It is forseen that automobiles will gradually increase and the backward means of transportation will be eliminated in the course of time. Thus when planning the structure of a city, the requirements of modern city traffic must be taken into consideration. Roads should be planned according to their functions, with appropriately placed crossings, parking spaces, etc. But since evolution of the means of transportation can come only through a series of changing processes, it must be followed by a gradual evolution of the changing functions of the roads. This means also the evolution of different measures to be taken. The prospect of development quite different from that of Western countries.

31. In a way, such comparatively backward conditions afford opportunities to solve the problem of urban traffic in a more economical way. There is the possibility of fulfilling modern requirements without resorting to expensive construction of multi-level crossings, etc. Learning from the experience of European and American cities, it is deemed necessary to put special emphasis on limiting the increase of the volume of city traffic as a preventive measure. It is necessary to put a limit to the growth of the city both in size and population. The expansion of big cities is to be restricted, while medium and small size cities would be developed. Through proper allocation of places of residence and of work, and the proper distribution of facilities and public services, the traffic volume can be minimized fundamentally. Peking, as well as certain other cities in Communist China are now beginning a planned inter-exchange of residences, so as to make the places of residence of workers as near to places of work as possible. This shortens the distances of travel and at the same time decreases the volume of trips back and forth. For the same purpose it is advisable to develop various means of public transportation facilities to ensure the convenience of the inhabitants of a city. If all elements influencing city traffic and all possible measures are taken into consideration, there is every reason for the planner to be confident that a satisfactory plan for city transportation can be made.

The Aesthetic Problems of a City

32. While architects can disagree on this complicated question, the Rapporteur feels that the question of beauty of a city has never been merely the beautifying of individual buildings or of merely a few ensembles. The beauty of a city is

primarily to be found in the planning and distribution of buildings. It is often the case that the individual buildings in certain cities are generally ordinary in their appearances, yet an effect of harmony, richness and variation is achieved through proper planning: good choice of building sites, organic combination of buildings of different character, rational adaptation to the topography and other natural elements, ample planting and verdure, organic and harmonious correlation with historic monuments, appropriate planning of streets and squares combined with the proper use of decorative street and garden "fixtures," and artistic disposition of proportion, colour, constrasts, etc. That is to say the beauty is achieved by making every element in the city serve mutually as a background to the others and to become an integral part in the make up of the urban vista. It is even more important to create beauty in a city with the coming of industrial standardization in the building industry. This approach to urban beauty obeys the principle of economy, but it demands ever greater ingenuity and creativeness of the architect. Whatever be the case, the beauty of a building or a city must be created on the foundation of utility and economy. Beauty of a city can be created only through the unity of functional contents and aesthetic forms.

Some Problems Particularly Connected with New Cities

33. Causes for the Birth of New Cities. The building up of new cities in Communist China and Korea are in most cases the outcome of the execution of national plans of construction, where industries, water conservation works and other constructions are put into reality. In pre-communist China more than 70% of industry and major cities were located along the seacoast. To redistribute productive forces in the whole country and to locate industries near sources of raw materials and fuel and to areas of consumption, as well as to take steps to elevate the degree of industrialization in some backward regions, a number of new industrial bases and new cities with new industries were built up in accordance with the national plan of construction. New cities also appeared in mining districts, timber cutting districts and district for health and recreation (rest-cure). A new city is taking shape, for example, at the site of the scheme for taming the Yellow River, near the Sanmenxia hydroelectric plant.

34. Unless conditions are such that a city must be built up from scratch, it is desirable to use or to choose the site in proximity to some existing settlements. This makes it possible to utilize the existing facilities of the settlements, but is it also advantageous to the gradual reconstruction of such settlements. And it is quicker and more economical in terms of industrialization in the national economy. Therefore, Communist China will in the near future make maximum use of and redevelop and expand existing cities--besides building a limited number of new cities.

35. Another type of new city is the satellite town for the restriction and dispersal of the population of big cities. In Japan, where industrialization is comparatively high, a series of satellite towns have been considered around Tokyo and other big cities to ease off the acute shortage of housing, transportation

and other town facilities and generally to ease the burden of the center city. But it is difficult to attract industry to new towns because of existing conditions of operational finance. The municipality of Shanghai in Mainland China is also considering the dispersal of part of its small-scale industries and to create in its neighborhood a number of satellite towns. Of course these towns should not be merely "dormitory-towns." The local employment of the inhabitants must be assured, and small towns should be used as a basis for the establishment of such satellite towns.

36. Steps in the Realization of the Plan, Influence on Planning Thought. In drawing up a city plan, whether the emphasis should be on the immediate or distant future is often debated. Chinese planners feel that the two kinds of planning are mutually dependent and that neither should be overlooked. The object of a city plan is to appropriately allocate the constructions of the immediate future. Therefore, the plan of a city must begin with the requirements and conditions of the constructions at hand, with the existing conditions of the city, and with the requirements of the near future. The constructions of the immediate future should be developed in concentrated regions or patches, closely correlated so as to give the maximum facilities to production and to living while using the minimum acreage of land and financing. In placing residential areas as close to work as possible, several residential areas may be developed with no immediate prospect of their being joined together. They are treated as separate residential areas, with amenities and facilities provided to satisfy the requirements of the immediate future, but with grounds reserved for the needs of the future.

37. But Communist Chinese planners have not forgotten the distant future of a city, for they know this would be a mistake. A city will be continuously in a state of renewal and development; and it will be developed for the fulfillment of the requirements set forth by the development of the nation's economy and by local conditions of individual cities. Thus in the planning of a city the planner must contemplate the future in view of the conditions and possibilities of future expansion, with necessary grounds reserved for further developments. Presently in Communist China the plans of the distant future are in mere outline form, with detailed plans drawn up only for the immediate future.

38. Requirement of Varied and Rich Appearance. In some new cities one gets the impression that they are cut and dried. This may be due to incompleteness of public facilities, scantiness of plants and verdure, endless monotony or architecture and simple, mechanical site-planning. On the other hand, because of excessive decoration on buildings, insufficient consideration of the functions of the buildings and disregard of the natural environment, the effect may be one of highly unnatural affectedness. The Japanese planners say monotony is unavoidable due to a lack of construction capital, but there are well known examples of unsatisfactory developments which had ample funds, as well as humble achievements which are quite pleasing. There are also opinions about the industrialization and standardization of the building industry killing off individuality in architecture and thus leading to monotony. Actually, however, standardization (through increased

speed in building) has advantages in bringing about unity and harmony of buildings in an ensemble.

39. A concrete example is the architecture of old Peking. From the Emperor's Palaces to each house of the ordinary people, construction was in accordance with the typication, standard modules and standardized structural members of the official "Code and Specification" set by the Ministry of Works in the first half of the 18th century. A careful analysis will reveal that the buildings are in a sense all the same, but that the effect is lively and varied. Similar successful examples are to be found in some urban construction today. The primary causes of shortcomings in this field are the insufficient endeavour of the architect, especially his preference in the designing of individual buildings without due consideration of the designing of ensembles as integral buildings without due consideration of the designing of ensembles as integral wholes. When the architect can integrate into his design his own ability and creative thinking with the requirements imposed by industrialization and standardization and by large scale construction within short time limits, new cities need be neither monotonous nor artificially affected.

Special Problems of Reconstruction and Redevelopment of Cities

40. Readjustment of Urban Population Densities. Many cities in East Asia have extremely high population density. This is a consequence of the political and economic situation of the past, and such cities must be thoroughly redeveloped and their population densities must be readjusted. But this will be difficult and can be achieved only through long term efforts in the development of production. Shanghai has planned to remove from the city certain small size industries to lower the population density. The physical expansion of some cities has reduced the density, and this will continue to help to some extent. In Japan, vertical expansion is being used to attempt improvement of living conditions in crowded central town districts, while holding the land people ratio constant. In North Korea, where almost all cities are being reconstructed the goal is the most appropriate density for each city.

41. Rebuilding Inferior Residential Districts. Slums are quite a general phenomenon in East Asia, with especially bad ones in Tokyo, Calcutta, Singapore, Djakarta and other big cities. The plans of good-hearted architects have seldom been realized. In some countries city slums are actually on the increase. The urban public facilities inherited by the government in Communist China were very backward. Of the 157 large and medium cities only 63 had water supply systems and only 59 had sewage systems--some of these only partial. Concentration has been on correcting conditions in districts where the situation was especially bad. The most unsanitary spots have been transformed. The open sewers of Peking are gone; Tao-run-ting, stagnant swamp of former years and surrounded by slums, is now a park. Similar work is reported in Tientsin, Shenyang, and Shanghai. Large sums have been appropriated for the installation of water supply system, sewers, electricity, telephone services, roadbuilding and other public facilities in workers' quarters of the cities.

Si-Cheng, Liang. Town planning in Communist China, North Korea... --1.

42. The "Patriotic-Hygienic Movement" has aided the cleaning up of slums. In Peking, it is reported, 349,000 tons of debris and garbage and 610,000 tons of human manure were removed from the city during the year and a half after the present regime took over. At present the elimination of flies, mosquitoes, rats and sparrows is being pushed through the programme of the "Extermination of the 'Four Evils'" and some towns and larger areas have been declared free of these pests.

43. Inferior districts and slums are generally associated with dirt, dampness, dilapidation, suffering, hunger, unemployment, contageous diseases, prostitution, crimes, etc. Most of the principle evils have been eliminated in Communist China's cities. The houses remain old and somewhat crowded and the standard of public facilities are still low, but cleanliness and orderliness is improved. Malignant epidemics are unknown. The old, inferior houses, of courses, must be replaced by decent, livable houses; and this is the determined policy of the government. But this will take time and can take place only step by step. Much work has already been done: Great numbers of sheds in Shanghai's shanty towns have been demolished, with the occupants now living in government-built houses. In the municipality of Tientsin 3.5 million M^2 in floor area of housing was built in 1952. In Peking, Wuhan, Taiyan and Lanzhou 2.1 million M^2 in floor area were demolished in 175 cities. Further reconstruction of these dilapidated areas will follow the tempo of development in the national economy.

44. Removal of Noxious Industries from Residential Areas. There are difficulties in this problem. Technical measures and measures in planning administration should be the approach, rather than taking industrial removal as a first consideration. Severity of measures will depend on the degree of noxiousness of the industry. Those with only slight noxious danger may be permitted to remain on condition that certain technical measures be taken to minimize the harmful effect. The restriction of further expansion can also be used, and a zone of restricted building can be drawn. Industries of dangerous noxiousness must be compulsarily removed, and strict enforcement is required here.

45. Treatment of Tradition and Innovation. How can the local tradition be respected while taking into consideration present economical requirements and technological opportunities? Tradition is to be respected but we should never be nostalgic for the past. The prerequisite is the fulfilment of the demands of today's life and technical economy. Only what is useful to us today in tradition should be incorporated. Its scum must be discarded and just its essence be extracted.

D.H.O.W.

Ceylon National Planning Council, Technical Working Group
ECONOMIC AND PHYSICAL PLANNING
Report, (undated) 6 pages, mimeographed.
71 ; 338.98 (540)

1. This report was prepared by a group established by Ceylon's National Planning Council in September, 1958 to study the general relationship between and the integration of economic and physical planning. The group was aided by Mr. Oliver Weerasinghe of the United Nations Bureau of Social Affairs.

2. Recent studies in the field of overall planning have clarified the major outlines of future economic development. At this stage it may be opportune to explore the possibility of relating the programmes of economic development which are being formulated to physical planning. This would ensure a coordinated pattern of development--economic, social and physical.

3. The subject of regional physical planning was the theme of the United Nations Seminar in Tokyo, held during the summer of 1958. One of the main conclusions of the Seminar was the need for the formulation of policies and programmes for development based on comprehensive regional planning in which physical, economic and administrative planning are coordinated and also integrated with national planning efforts. Current trends influencing regional planning and the application of regional planning techniques to metropolitan areas, to areas in which natural resources are being developed, and to rural reconstruction areas were also discussed at the Seminar.

4. Application of these considerations to Ceylon indicates the need at the present time to establish a procedure by which economic planning programmes can be coordinated with physical planning. Many development projects now tend to be conceivedofand implemented in terms of such direct results as output without adequate consideration of the social, economic and human aspects. The Town and Country Planning Department has existed for more than 10 years, but it has been used only for preparing local planning schemes which have very little bearing on a comprehensive physical plan. Present policy in implementing economic development programmes is to call upon the several Ministries to implement those sections in the programme that concern them. This results in a considerable amount of overlapping in land uses, distribution of population, provision of social services, transport and communications, and the distribution of markets. No action has been taken to prepare a coordinated plan of physical development.

5. It is felt that steps now being taken in the field of economic planning offer an opportunity to overcome these shortcoming and to bring about an integration of physical and economic planning. To achieve this integration, within the framework of the planning process contemplated by the National Planning Council,

physical planning might be introduced in these three planning stages :

a. Assessing possibilities, establishing an overall framework, and formulating firm programmes for individual fields;

b. Preparing a coordinated plan;

c. Implementing and reviewing progress.

First Stage

6. Technical Working Groups, which were appointed by the National Planning Council, have assessed the potentialities of development in different fields. The next in the planning process is the working out of specific measures and programmes aimed at exploiting these potentialities. The Planning Council is now engaged in this task in consultation with various ministeries and departments. It is felt that some guidance in physical planning is important even at this stage to avoid haphazard development. Such guidance should take the form of criteria issued by the Cabinet and the National Planning Council to each of the ministeries and departments giving the requirements of physical planning. These criteria would be based on the desired goals of economic and social progress and would vary according to the type of activity in the different development fields.

7. Thus in the field of industrialization, physical planning criteria would indicate the physical factors that should be taken into account in the location of new industries and in the expansion of existing ones: The criteria for the establishment of transport and communication services, the provision of water, lighting and housing, the reservation of zones for different uses and the measures for the disposal of industrial wastes. Likewise, in the field of agriculture, fisheries, power, transport and communications, tourism and other fields of economic planning and development, the physical planning directives will provide necessary guidance to ministeries and departments concerned.

8. Formulating such criteria should be undertaken at once by the Department of Town and Country Planning in collaboration with the Planning Secretariat and the several ministeries and departments concerned. The Ministry of Local Government and Cultural Affairs should be requested to instruct the Town and Country Planning Department to give the highest pirority to this work.

Ceylon, National Planning Council... Economic and physical planning --3

Second Stage

9. Next is the preparation of a coordinated plan adapting the programmes of development in each sphere to the availability of finance. Physical planning should play an important part at this stage of coordinating the different development programmes. The aim should be to establish on the basis of the economic plan that emerges, the outline of a comprehensive physical plan for the whole Island, consisting of the approved development projects. The Plan would show the proposed uses of land for agriculture, industry, forests, colonization, irrigation, water catchments, urban development (including sites for new towns and villages); the main lines of communication (roads, railways, waterways and air routes) proposed to be established; the proposed ports and airfields; and the anticipated growth of existing towns and villages as a result of economic development. The outline physical plan would serve as a framework within which more detailed physical plans for regions and local areas could be prepared. It would also serve the purpose of regions and local areas could be prepared. It would also serve the purpose of taking appropriate action in advance for reserving land for development projects.

Third Stage

10. The comprehensive physical development plan will need to be revised from time to time in the light of changing conditions. In the implementation of the development programmes also it is inevitable that there will be changes. It is therefore necessary that some agency should keep under review all such changes which have a bearing on physical planning. This agency would work in close co-operation with ministries and departments and would be responsible for the assembly of data and for surveys relating to existing economic, social and physical conditions in the light of changing circumstances.

Physical Planning Agency

11. The appropriate agency is the Town and Country Planning Department. As presently equipped, however, the Department would not be in a position to carry out stages two and three. It would then be desirable to strengthen the Department and to set up special sections to undertake these specialised services as a continuing process. The present working group would continue as liaison between economic and physical planning. United Nations assistance is necessary.

Ceylon, National Planning Council... Economic and physical planning --4

12. The following recommendations were made:

a. "That immediate steps be taken to establish criteria for physical planning for each of the major fields of development in the Island so as to assist Ministries and Departments in the preparation of their programmes;

b. When a co-ordinated economic plan is finalized, an outline physical plan should be prepared for the whole Island based on the former. This outline will be used as a framework within which more detailed physical planning for regions and local areas could be carried out;

c. Machinery must be set up for continuously reviewing the physical plans in the light of channing conditions;

d. The Town and Country Planning Department be strengthened to cope with the special work that these services will involve;

e. An immediate application be made to the United Nations for suitable technical assistance."

CONSTRUCTION

E.F.N.T.

Martin, Bruce
MODULAR DESIGN INFORMATION SHEET TWO
Architectural Desing, March 1959, p. 118.
721.013 (100)

1. Starting with the publication of Modular Design Information Sheet One in the last issue of EKISTICS, it is our policy to keep pace with the appearance of Bruce Martin's important series. Accordingly, we present numbers two and three in this issue.

General Purpose of the Module

2. The purpose of the module is to serve as a dimensional basis for the sizing of standard industrial building components so that the dimensions of each component will be significantly inter-related with the dimensions of every other component on the standard range.

Function of the Module

3. The module performs three distinct functions in the system of modular coordination:

a. As a means of simplifying and inter-relating component sizes, it is the coefficient of all the sizes on the modular component size range;

b. As a modular size, it is itself the first size on the modular component size range;

c. As a coefficient of design dimensions and as a link between design and industrial production, it is the basic increment of size in the modular reference system. In designs based on such a reference system, modular components will fill design spaces which are multiples of the module size. Thus, because the basic increment of size in planning and the common coefficient of sizes in which components are manufactured will be identical, the particular components selected by the architects should in all cases be able to be easily organized and simply related to the individual design. In this way, the necessary co-ordination between standard industrial supply and individual design demand, which at present does not exist, should be successfully effected.

Uses of the Module in Design

4. The following uses are given:

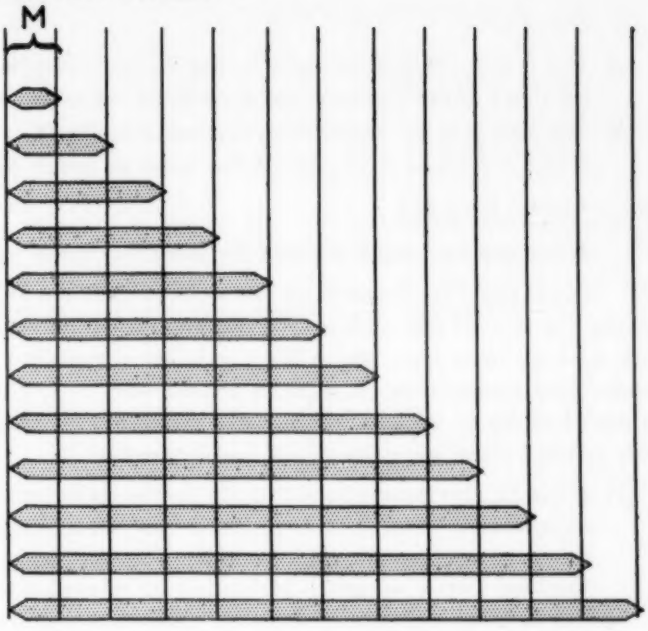
a. As the unit of size in the 'module grid', it can be employed directly as the actual unit of increment. (The module grid is used for the large scale drawings necessary for detailed work.)

b. As the basis of the various 'modular grids,' it can be employed indirectly to derive the increment for the three types required. In ascending order of size, these modular grids are:

(1) The planning grid for general layout of the building, which will normally be sized at multiples of the module of the order of,

Architecturel Design, March, 1959.

MODULAR DESIGN INFORMATION SHEET 3



MODULAR SIZES

A modular size is a multiple of the module and is therefore one of a range of inter-related sizes. It is used as the nominal or standard size for components, and also designates the space in the modular grid occupied by a modular component.

PURPOSE OF MODULAR SIZES

Modular sizes are applied to industrial components to simplify design, manufacture and assembly and to facilitate international trade.

ADVANTAGES OF MODULAR SIZES

1. They correspond or are close to existing sizes of components.

Examples of existing sizes of components:

Wood Wool Slab (B.S. 1105 : 51)
24in. × 72in. × 2in.
Natural Stone Coping (B.S. 1235:45)
12in. × 48in. × 2½in.
Bath (B.S. 1189 : 44)
28in. × 72in. × 24½in.

2. They provide a limited number of sizes suitable for the range of industrial components. Their use reduces variety of size and so simplifies production, stocking and distribution.

Sizes in use in British Standards for building components to the nearest inch: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27. . . .

Sizes in the modular range (in inches): 4 8 12 16 20 24 28. . . .

3. They readily combine with one another to give other dimensions on the range, so that components whose dimensions are based on these sizes add together easily.

Additivity of modular sizes (in modules)
An example of two sizes combined to give other modular sizes. The two modular sizes taken are 2 and 3 modules

2	2	(8in.)
3	3	(12in.)
2 2	4	(16in.)
2 3	5	(20in.)
2 2 2	6	(24in.)
2 2 3	7	(28in.)
2 2 2 2	8	(32in.)
2 2 2 3	9	(36in.)
2 2 2 2 2	10	(40in.)
2 2 2 2 3	11	(44in.)
2 2 2 2 2 2	12	(48in.)

4. They have a close relation to the modular sizes on the range of metric modular sizes, so that when a change is needed, each inch size has a corresponding metric size.

Metric modular sizes in centimetres	10	20	30	40	50	60	. . . .
Equivalent sizes in inches	3·94	7·87	11·81	15·75	19·69	23·62	. . . .
Nearest inch modular size	4	8	12	16	20	24	. . . .

REFERENCES: European Productivity Agency: *Modular Coordination in Building*, Project No. 174. August 1956.
B.S. 1105 : 51, 1235 : 45, 1189 : 44. B.S. 2856 : 57 Metric Conversions.

Martin, Bruce. Modular design information sheet two --2

say, 6, 8, 9, 10, and 15 M;

(2) The structural grid for positioning columns and beams, which will normally be sized at multiples of the module of the order of 20 M to 60 M;

(3) The site grid for positioning the building itself, which will normally be sized at module multiples of the order of about 40 M upwards.

Why a 4-Inch Module?

5. There are two major reasons for selecting the 4 inch. module, these are:

a. Technical requirements of the module as a coefficient of industrial sizes. Since the size of the module will automatically determine the general range of the modular sizes from which the particular dimensions will be selected for individual components, it must be chosen with regard to its ability to produce a useful range of modular sizes. The modular size range for building components has to meet three main technical requirements:

(1) It has to correspond realistically to the existing size range covering all components--that is to say, there must be sufficient sizes on the modular range to account for the necessary sizes for every component from the smallest to the largest. Secondly, to minimize the alteration of each of the existing component sizes to its nearest modular size, there must not be too great an interval between the modular sizes. Both these conditions means that the module must be a small dimension, and studies have shown that it cannot economically be above 4 inches.

(2) The modular range must constitute an appreciable simplification in the number of sizes as compared with the existing size range. While some simplification is automatically effected by introducing sizes that are rounded multiples of the module and all the present fractional sizes will thus be immediately excluded, a sufficient degree of size reduction requires the choice of as large a size as possible for the coefficient. But the upper limit is governed by requirement (1) and therefore restricted to 4 inches.

(3) Due to the additive nature of building, the modular sizes must be so inter-related that the highest possible degree of additivity--whereby any two component sizes will add together to a third modular size on the range--is obtained. Studies have established that, up to a certain point, additivity is most easily ensured when the module is large. But beyond 4 inches the additivity will be achieved only among the larger sized components.

Thus, to meet all three requirements taken together, 4 inches is the best possible size for the module, and in itself it provides a range of sizes with sufficient correspondence to existing sizes combined with a real measure of simplification and additivity.

b. International considerations. Confirmation of this choice may be found in studies abroad. The USA has long adopted the 4 inch. module and three other countries are considering its adoption. Among the metric countries, ten nations have adopted the 10 cm. module, which is the nearest whole number equivalent to 4 inches. Moreover, European Productivity Agency work has shown the need for a module in international alignment to facilitate trade in interchangable components. And an International Standards Organization recommendation will will propose 4 inches and 10 cm. as the international sizes.

GENERAL

A.D.M.R.

Mars, John
ECONOMICALLY ACTIVE POPULATION IN CENSUSES: UNDER-ENUMARATION IN UNDERDEVELOPED COUNTRIES. The Economic Weekly (Bombay), December 13, 1958, pp. 1549-1556. (Tables)
312

1. This is an informative critique of occupational population statistics in underdeveloped countries. Sixty-six areas are studied, of which all but three had annual per capita incomes of less than $250, the three exceptions being Cuba, Puerto Rico and Venezuela. No communist countries are included in the study, except for Yugoslavia.

2. The total population in the studied economically underdeveloped countries and dependencies was 1,299 millions in 1954. (In the same year about 681 millions lived in underdeveloped countries with communist or pro-Soviet Governments, including 606 millions in Asia and 75 millions in Europe.) In all, of the total world population of 2,652 millions in 1954, 1,980 millions or 74.7% lived in underdeveloped economies.

A Paradox in the Proportion of Employed

3. In three highly developed countries (U.S.A. , the U.K. and New Zealand) overall percentages of economically active persons to total population range from 38 to 46. With the notably lower subsistance levels in underdeveloped countries, one would expect corresponding proportions in such countries to be much higher than these figures. It is true that in Bolivia, Haiti, Yugoslavia and Thailand, as well as nine areas under supervision by major Western powers, the percentage of economically active population to total population is 50% or more. By contrast with these areas, 40 of the 66 underdeveloped areas apparently have lower proportions of working population than Britain does; and 37 of them seem to have a smaller overall economically active porportion than is found in the United States.

4. The fact that most of those underdeveloped areas having high percentages of economically employed population are under supervision of highly developed nations (six British, two French, one U.S.), leads to the suggestion that differential statistical procedures are involved. Even in the highest reported figures, there may be some understatement of the proportion of the economically active population.

Capital and Working Population

5. Economic history indicates that it is only in the initial period of advance that developed countries buy their progress by harnessing larger proportions of their population to work. In every case, both the proportion of occupied persons in the population and the length of the working day have been steadily

reduced during the two centuries since the industrial revolution. The capital per capita is highest in the United States, and it has a lower proportion of occupied persons than in Britain (39.2% compared to 46.2%). The small population of the islands of New Zealand however has a per capita income of $1,075 compared to US $1,845 but a percentage employed of only 38.2%.

6. The amount of capital per head in underdeveloped areas is but a minute fraction of the U.S. figure. Thus the proportion of occupied population in all underdeveloped areas should be much higher, unless the inhabitants of these countries were ascetic and consumed next to nothing or else nature were so bountiful that consumers' wants could be satisfied with practically no effort. Neither of these premises is true: In all underdeveloped countries there is a craving for more consumption. In most of them there is overpopulation with respect to land, mineral and power resources.

7. This means that in the indigenous industries of underdeveloped countries the law of diminishing returns operates strongly. Consequently the proportion of economically active persons is bound to be high, even though output and consumption standards may be low. Even if an allowance is made for disguised unemployment among the economically active population, the final figure for the percentage working should remain very high.

Evidence of Under-Enumeration

8. A comparison of the figures within each geographical areas gives a clue to the reason for statistical results which are contrary to these expectations. In North Africa, for example the Moslem populations of Algeria, Egypt and Morocco have similar economic, social and political characteristics. (Or at least they had in 1954, Ed.) While the overall proportions of economically active persons are not too dissimilar, the figures given for males and females diverge sharply. Variations of such magnitude in neighbouring countries of similar culture are probably statistical illusions. Another example is in the age of entering labour force: In Egypt children in the age group 5-14 years are included, but this is not the case in Algeria and Morocco.

9. Similar contrasts are found between Honduras and the seven other underdeveloped countries on the middle American mainland for the proportion of females working. The contrast is even more striking between India and Pakistan in South Central Asia. In South East Asia countries show sharp contrasts for overall porportions, porportions of males working and proportions of females working. It is felt that such sharp contrasts can be explained only by differences in census enumeration policy. The important effect such different census policies can have is brought home by comparing figures given for Yugoslavia in 1948 and in 1953. Unpaid family workers were counted in the earlier census and dropped in the later one, with a major effect visible in the proportion of women employed.

Mars, John. Economically active population in censuses... --3

Sex and Age Composition

10. The most important genuine variations in the proportions of the economically active populations of the underdeveloped countries are due to difference in sex and age composition. It is suspected that many underdeveloped areas under-enumerate working proportions for the age groups 5-9.9 and 10-14.9 because the employment of such individuals often is illegal. For purposes of description, these two age groups are called "primarians" and "pubescents" respectively. The age group 15-64.9 years is called "workagers," and the category for those aged 65 years and over is called "oldagers."

11. Clearly the highest proportion of economically active persons is to be found among the "workage" category. For the "oldage" category, there are highly variable mortality rates from country to country; and, since the proportion of economically active persons in this category is high, even a moderate variation of the proportion of oldagers will affect the overall proportion of economically active. Variations in the primarian and the pubescent age categories will similarly affect the overall proportion of economically active. National differences in the proportions of different age groups employed is to be explained by differences in economic conditions, in culture patterns, and especially in enumeration policies and practices.

12. The problem of under-enumeration of child labour in underdeveloped areas is especially important in its effects on the overall statistics. While the problem exists in developed countries, its effect on the total statistics of the labour force is negligible. A problem in this enumeration is that different age categories are used in different areas when the census is taken. The high figures reported in Egypt, Guatemala, Haiti are probably good indicators of the extent of under-enumeration of the age-groups below the core of the labour force itself. Collection of more accurate statistics for these younger age groups would probably be facilitated if laws allowing limited employment of child labour were passed. Where this is not possible, an intensive study using skilled enumerators could provide a good estimate of the standard of under-enumeration in regular censuses.

Unpaid Family Labour

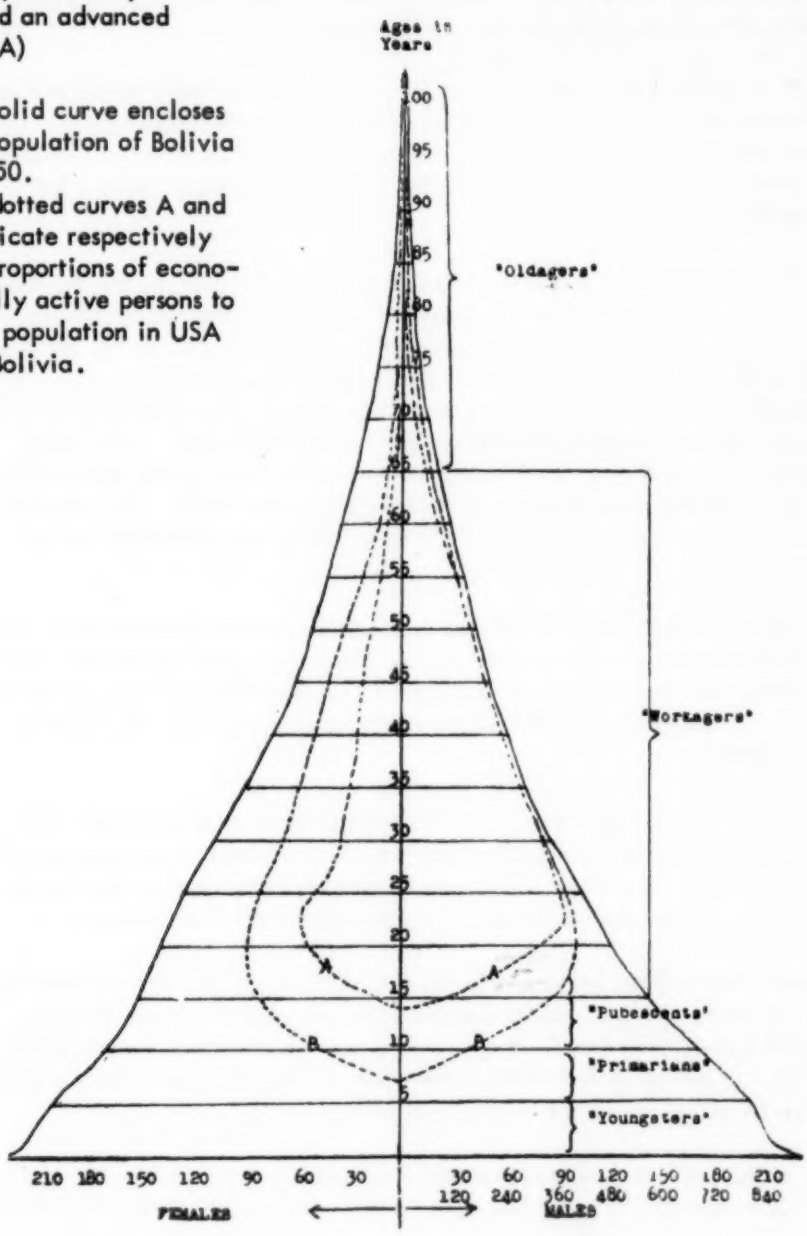
13. Variation in the proportion of females employed (paid and unpaid) varies from 14.1% in Guatemala to 99.2% in Egypt. This range, which is much higher than that for men, indicates a variation in the inclusion or exclusion of unpaid family labour on farms, in business and in domestic industries. There is some indication that the range of percentages of females employed in other than domestic duties is usually between 40% and 60%. A full enumeration of this kind of labour might have increased the overall proportion of economically active by 10% or 20%.

14. There is a similar under-enumeration of old women in many under-developed areas. The highest proportion of female oldagers working is 66.2% in Egypt; the lowest is 4.4% in Israel. It would seem that many of the older women must have been working (especially widows) but that the census enumeration practices simply did not provide for them.

The Economic Weekly, Bombay. 13th December, 1958.

Economically active persons by age and sex groups in an underdeveloped country (Bolivia) and an advanced country (USA)

(1) The solid curve encloses the population of Bolivia in 1950.
(2) The dotted curves A and B indicate respectively the proportions of economically active persons to total population in USA and Bolivia.



Mars, John. Economically active population in censuses... --4

Bolivia and the U.S.A.: A Comparison

15. The form of an ogive arch or an inverted funnel represents the sex and age grouping of a population. Age in years is shown on the vertical axis; the number of females at each age is shown to the left of the vertical axis and males are shown to the right of the axis. Inside the total population figure, the economically active may be shown by a dotted curve.

16. In such a diagram it is helpful to compare the economically employed proportions of a developed country with those of an underdeveloped country. Using the total population figures for Bolivia, the proportions of economically active persons to total population are shown for the United States (line A) and for Bolivia (line B).

17. It is believed that the economically active curve for Bolivia can be taken as representative of the conditions in many, if not most, underdeveloped countries. If therefore appears that if the age groups of old and young people are relatively high due to high birth rates and low mortality rates, the overall proportion of the economically active would be low, and vice versa. Since 1945 the birth rates of practically all underdeveloped countries have changed. The infant mortality during the first year of life and the mortality rates of the age groups 0-5, 5-10 and over 65 have been lowered, often spectacularly. This process is still continuing; and while it does, the proportion of economically active is likely to fall.

18. It is likewise clear that, as females make up more than half the total population, if the percentages of employed among females remains relatively small, the economically active population would be low. Reduction of high maternal mortality rates in underdeveloped countries will tend to increase the relative number of females.

19. A reduction in the high mortality rates among those in ages 15-65 will, on the other hand, broaden that part of the population where the proportion of workers is very high. Moreover, if better health services improve the health of those over 65, the proportion of working oldagers might rise perceptably.

20. If census enumeration policy excludes the very young and the very old of both sexes, as well as female workers at all ages, the overall proportion of workers would appear very low. But even if a correct enumeration policy for workers of all age groups is followed, differences in sex and age groups would account for substantial variation in the total labour force.

EXAMPLES OF CURRENT WORK BY DOXIADIS ASSOCIATES

A LONG TERM HOUSING PROGRAM

FOR LEBANON

Summary of the interim report issued to initiate discussions for the future of a long Term Housing Program for Lebanon with the Government of Lebanon - United States Operation Mission, Lebanon.

C.D.E.G.O.P.

Doxiadis Associates

A LONG TERM HOUSING PROGRAM FOR LEBANON

333.322.6 (56)

INTRODUCTION

1. This is the third report to be submitted to the Government of Lebanon. The other two dealt with the general housing situation, basic principles governing the drawing up of a long-term housing program, a recommendation that a National Housing Program be established and suggestions for financing it. It was further suggested that for this long-term program to be effective, an initial five-year program, or Basic Foundation Program, should be set up immediately.

2. The present report gives a tentative outline of this Basic Foundation Program, which is estimated to cost around LL 25-30 millions per annum, and a system of organization for the National Housing Program.

3. For the purposes of estimating housing needs the population of Lebanon has been considered under the categories of those living in slums, those living under over-crowded conditions; the provision of housing for civil servants; those needing housing as a result of new development projects; and finally, the effects of general urban and rural amelioration upon housing needs.

4. The solution of pressing problem of housing for Palestinian refugees has been considered to fall outside the Basic Foundation Program, though the immediate need for 11,000 minimum dwellings at a cost of some LL 42 million is put forward as a matter of political determination.

5. The rehabilitation of earthquake and flood victims has also been left out of the program as these fall within the province of the National Reconstruction Board.

6. Also the provision of accommodation for the growing tourist trade, though important in raising the general economic level of the country, is not included within the National Housing Program as it is considered that this can be handled by private interprise.

7. It is however assumed that under a long-term Program ten tourists areas will have to be fully redeveloped and that each of these ten projects must include:

a. The preparation of a complete lay-out plan.

b. The immediate implementation of this lay-out plan in so far as certain urgent works are concerned. Such works may be the demolition and rebuilding of certain houses, the construction of community facilities, roads, parks, planting of trees, etc.

c. The amelioration of the housing conditions of families in the area through the construction of works of the category referred to below in para 15.

d. The construction of the necessary works for the tourist development of the settlement.

8. In the light of the above assumptions it has been estimated that the cost of each tourist area to be developed will be of the order of LL 1,200,000

Doxiadis Associates. A long term housing program in Lebanon --3

THE PROBLEMS

Slum Clearance: (5,000 dwellings)

9. An earlier report had established the need for slum clearance particularly in Beirut and Tripolis, not only on grounds of public health and economics but, even more importantly, for social reasons. The families living in these areas are social outcasts and there is no doubt that they should be permanently settled and should become part of the society they are living in.

Decrease in urban density : (8-10,000 dwellings)

10. This need was also established in detail in an earlier report. It is particularly acute in the old quarters of Saida, Tripolis and Tyre where the houses are not only very old but built exceedingly close together and even the most elementary installations of community facilities are either inadequate or do not exist at all.

Housing for Civil Servants: (6,000 dwellings)

11. The housing of the civil servants, who are the backbone of a good administration, should become one of the main planks of the program.

Development Projects: (3,250 dwellings)

12. The Litani Project and Special Industrial Housing Schemes: (1,250 dwellings): projects will require dwellings for all categories of technicians employed in industry, from workers to engineers and managers.

Rural Dwellings: (2,000 dwellings)

13. The irrigation of some 21,500 hectares in the areas of Bekaa, Nabatiye and Saida-Beirut is foreseen when the Litani project will be completed. Mention is further made of the area of Kasmie (6,000 hectares) where the irrigation works have been already completed, and of the areas of Yammoune (13,000 hectares) and Akkar (12,000 hectares) where some projects have been implemented but the works have been now suspended.

14. Almost all the land which is going to be irrigated is already cultivated by dry farming methods and a part of it is irrigated up to now by the Litani River through the use of very elementary methods. Therefore it is not foreseen that settlement of new families will be made on a large scale. Nevertheless, owing to increase in soil productivity, it is foreseen that a number of new families will be settled in this area. Furthermore, additional ekistic needs will arise due to the reform in the ekistic structure of the area. Such a reform may be caused by the probable creation of new settlements, or by the extension of those settlements which already exist in sites privileged to be situated near areas where new and favourable conditions will be created through irrigation and drainage works. These needs have been estimated to be of the order of 2,000 dwellings.

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Urban and Rural Amelioration: (70,000 urban and 80,000 rural dwellings)

15. This is far the largest problem in its scale, though, unit by unit, the costs are lower. The purpose of these works is not the building of houses but a general improvement in the living conditions of the families concerned through the execution of works directly connected with housing. These may be:

a. General communications or town-planning works, e.g. opening of new roads, formation of green betls, parks, etc.

b. Community facilities (new or amelioration of old water-supply, sewerage, electricity and road systems).

c. Works connected with the improvement of the house itself, e.g. addition of toilet, replacement of old timber roofs by means of concrete, supply of electricity etc.

By means of amelioration works the preservation and exploitation of the existing building stock is achieved at a relatively small cost per family. It is thus possible in many cases, by means of carefully studied amelioration works to provide an acceptable minimum standard of housing facilities needed to preserve quarters which might at first sight appear to require pulling down and rebuilding. From the first conclusions drawn from the special survey of the settlements in Lebanon, it is evident that the need for amelioration works all over the country is immense. Water-supply works are necessary, especially in rural districts, sewerage works are needed, particularly in urban districts, roads are required everywhere, old houses in villages must be preserved through the replacement of their roofs, etc., in order to provide acceptable conditions of living. Thus the estimate on which the figures are based, i.e. that 70,000 urban and 80,000 rural families are in need of amelioration works, must be regarded as very conservative.

Annual Housing Requirements: (6,000 dwellings)

16. The annually reccurring needs for new housing, over and above that normally provided by private enterprise, were discussed at length in an earlier report. The above figure is a conservative one and represents the average needs, not those for the cheapest possible houses only.

Toral Housing Requirements: (24,000 new dwellings plus 6,000 annually and 150,000 rehabilitated).

17. The problem, in short, is to find a method by which Lebanon can provide her people with 30,000 new dwellings in the shortest possible time, rehabilitate 150,000 more and keep up a steady program of 6,000 new dwellings a year.

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THE POLICIES

18. The basic principles to be taken into consideration are summarized below:

    a. The solutions to be given must first and foremost tend to the economic development of the country.

    b. These solutions must be studied in conjunction with the other development projects of the country and incorporated in a general Development Plan. Therefore there is a need of such a general Plan and of regional plans for each area.

    c. Special attention should be given to the development of the rural areas in order to prevent the abandonment of the open country in favor of the cities, which is the result of the huge difference between the average income per capita in the countryside and the large cities.

    d. The houses constructed by the Government must become the property of the beneficiaries, at least in most cases, and be paid by the beneficiaries. Therefore, the cost of each house must be in proportion to the income of the family which will live in it.

    e. The mobilization of private capital and of private initiative is indispensable. It is evident that the requirement are so great that in no case will the Government funds be adequate.

Relation between cost of house and family income

19. Two assumptions have been made, based on studies of the present relation in Lebanon between rents and income.

    a. The cost of the house must not exceed three times the annual income of the family which will occupy it, or four times in special cases.

    b. The cost must be such that it can be repaid by the family in annual instalments which will not exceed 20% of its annual income, within a period of not more than 20 years, at an interest of not less than 3%.

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20. From field surveys, supplemented by the Churchill survey of Beirut, the following table of urban family incomes was drawn up:

Income group (1)	Average monthly income (2)	Average annual income (3)	Percentage distribution of income groups of urban families among total urban population (4)
A	100	1,200	28%
B	200	2,400	28%
C	300	3,600	23%
D	500	6,000	10%
E	700	8,400	4%
F	1,000	12,000	3%
G	1,500	18,000	2.5%
H	2,000	24,000	1.5%

Taking into consideration that the families of the higher income groups (i.e. with an income of more than LL 6,000 per year) are able to face their housing problem by their own means we reduce, in the formulation of the National Housing Program, the percentage of the income groups from E and over and we increase the percentages of the three lower income groups A, B and C. The following new percentage distribution results for the urban families which will benefit from the Government Program.

Income group (1)	Average monthly income (2)	Average annual income (3)	Percentage distribution of income groups of the urban families to be assisted by the Government Program (4)
A	100	1,200	30%
B	200	2,400	30%
C	300	3,600	25%
D	500	6,000	10%
E	700	8,400	3%
F	1,000	12,000	1%
G	1,500	18,000	0.7%
H	2,000	24,000	0.3%

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Calculation of the cost of a house

21. The cost of a house is taken to include:

a. Cost of land.

b. Construction of community facilities, i.e. the proportionate cost of each house of the water and electricity supply, sewerage and road construction of the settlement.

c. Actual cost of construction of the house.

d. General services including administration, planning, designing, and supervision. These general expenses are calculated at 10% of the expenditure under headings b and c.

22. Each of the above elements may vary considerably, depending on the location of the settlement and of the special conditions which predominate there. The variation may be greatest of all in the case of the cost of land. In one urban district it was so high that it amounted to 30% of the total cost (21 LL/m2) whereas in rural districts it can be almost nil. For this reason a study has been made of both single-storey and two-storey types of houses for each income group, while solutions providing for multi-storey houses are also being considered. The two-storey houses are intended for regions where land costs are high and for the middle and middle-to-low income groups, since the wealthier classes are in a position to pay for the luxury of single houses, while the very poor with difficulty adapt themselves to shared accommodation. In the case of the latter, there is an additional difficulty, arising from the fact that most of them are only provided with nuclei and not complete houses (see para 26 below). The completion of the nuclei in the case of two- or many-storeyed rows would have to be synchronized for all the families in the same block, a very difficult matter in the case of such poor families. On the other hand, where land is cheap, the difference in cost between a single and a two-storey dwelling is not very great. It is however, always a factor to be taken into consideration, owing to the cost of the community facilities, which is proportionate to the area of the plot (i.e. approximately double in the case of single-storey dwellings) and owing to the economy in foundations and roofing which is obtained in the case of two-storey buildings.

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23. The table which follows gives approximate costs of each house type, based on current unit prices and the conclusions of one project study.

AVERAGE COST OF URBAN HOUSES
FOR THE VARIOUS INCOME GROUPS

Income Group	No. of dwellings per house	Land	Land Development of the community	Construction of House	General Services	Total
A	1	1,040	1,000	3,700	470	6,210
	2	520	500	3,000	350	4,370
B	1	1,560	1,500	5,200	670	8,930
	2	780	750	4,300	505	6,335
C	1	1,760	1,700	7,650	935	12,045
	2	880	850	6,350	720	8,800
D	1	1,960	1,900	13,150	1,505	18,515
	2	980	950	11,050	1,200	14,180
E	1	2,080	2,000	18,300	2,030	24,410
	2	1,040	1,000	15,800	1,680	19,520
F	1	2,860	2,760	26,700	2,945	35,265
	2	1,430	1,380	22,650	2,405	27,865
G	1	4,160	4,000	39,600	4,360	52,120
	2	2,080	2,000	34,000	3,600	41,680
H	1	9,360	9,000	50,000	5,900	74,260
	2	4,680	4,500	43,500	4,800	57,480

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Mobilization of private capital

24. It is one of the basic aims of the Program to mobilize private initiative and private capital, so that they should make the maximum possible contribution to its objectives. This is made necessary by the following circumstances:

a. As has been pointed out above, the housing needs are so great that it is impossible to meet them solely out of State funds.

b. Private capital is available for housing projects. An analysis of annual investment in Lebanon shows that 50% of private investment was devoted to housing. The houses so built are of course mostly for the higher income groups, but this does not mean that it will not be possible to extend private investment to low income group houses, if the necessary prerequisites are assured by the Government.

c. It is natural that families in the lower income groups should be willing to offer their personal labour and other services for the construction of their houses, thus reducing costs to the minimum. Indeed, in the case of the lowest income groups, it is only in this manner that is will be possible for the cost of a house or part of a house, constructed and allocated by the State, to be paid off by the beneficiary on the favourable terms provided for in the program.

25. For the reasons given above provision is made in the National Housing Program for four types of assistance to those needing houses: the provision of a serviced plot of land; the construction of a house nucleus; the construction of a complete house shell without fittings; the construction of a complete house.

26. Serviced Plots: This provide the minimum housing facilities. It provides solely for the purchase of land and for land development, i.e. provision of water, electricity, sewerage and access road. It is intended primarily for the higher income groups, which can supply their own capital for house construction.

27. The House Nucleus: This represents the second scale of housing facilities. It is an intermediary stage between land development and the complete house. The nucleus is a part only of the house (i.e. one of the rooms of a two-room house) sufficient to provide rudimentary shelter. This nucleus can be provided completed or uncompleted (i.e. without plastering, doors and windows, finishing works etc.) depending upon the beneficiaries' possibility to complete it immediately or not. The family can occupy it, without great comfort of course - indeed with basic deficiencies - and can then complete it slowly themselves, beginning with what is most essential and then proceeding (on the basis of the architectural plan to be given them) with the additions which will complete the house: building of the second room, kitchen, etc. It is evident that the provision of this category of house is appropriate in the case of families in the lowest income groups, who cannot afford to buy a plot and build themselves a house, and who are not in a

position to reimburse the Government for expenditure on anything more than a minimum housing unit.

28. Construction without finishing: This is the next step. It is a complete house as far as the bearing structure is concerned, but without finishing (doors, windows, etc.) The provision of houses at this stage of construction is suitable for families in the middle income groups who are able to put up a certain amount of capital - it need not be very much - for the finishing of their house. In buying a house which is not finished they incur a smaller debt, while at the same time they have the opportunity of completing it in accordance with their particular requirements and tastes. = 56 UMS.

29. Complete houses: These are intended for the middle and low income groups, but the tendency will be to reduce the proportion of complete houses in the total program to the minimum possible, since it is the basic objective that each family should contribute to the effort for, and expenses of, the construction of its house.

30. Average cost of urban dwellings. The following tables give the approximate average cost of the houses for the various income groups, at each of the stages of construction mentioned above. On the basis of the considerations already outlined and the cost of each stage of construction we have divided the needs for urban dwellings into plots, nuclei, construction without finishing and complete houses, by income groups. This table (on page 417) also shows the price of the average urban dwelling in the case of the distribution which we have assumed. The price amounts to LL 5,400. If completed houses were constructed and supplied to all families, the average cost of urban houses would amount to LL 10,300 as shown in the table on page 418, according to the percentage distribution of income groups which has been accepted. Thus it will be seen that under the proposed program of urban dwellings private capital will contribute 48% of the total expenditure and the Government 52%.

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COST OF THE DIFFERENT STAGES OF CONSTRUCTION OF URBAN DWELLINGS

(L.L.)

Income Group	No of dwellings per house	Plot	Nucleus	House without finishing	Complete house
A	1	2,140	3,845	5,550	6,210
	2	1,070	-	3,710	4,370
B	1	3,210	5,355	7,500	8,930
	2	1,605	-	4,905	6,335
C	1	3,630	-	9,845	12,045
	2	1,815	-	6,600	8,800
D	1	4,050	-	14,060	18,515
	2	2,025	-	9,725	14,180
E	1	4,280	-	17,480	24,410
	2	2,140	-	12,590	19,520
F	1	5,900	-	25,370	35,270
	2	2,950	-	17,965	27,865
G	1	8,560	-	35,290	52,120
	2	4,280	-	24,850	41,680
H	1	19,260	-	50,060	74,260
	2	9,630	-	33,280	57,480

INDICATIVE BREAKDOWN OF URBAN DWELLINGS ACCORDING TO INCOME GROUP AND STAGE OF CONSTRUCTION AND CALCULATION OF THE AVERAGE EXPENDITURE PER DWELLING

Income group	No. of dwellings per house	Breakdown of income groups	Plots			Nuclei			Houses without finishing			Complete Houses		
			Cost per dwelling	% of dwellings	Part of the average cost	Cost per dwelling	% of dwellings	Part of the average cost	Cost per dwelling	% of dwellings	Part of the average cost	Cost per dwelling	% of dwellings	Part of the average cost
A	1	30%	-	-	-	3,845	20%	769	-	-	-	6,210	10%	621
	2		-	-	-	-	-	-	-	-	-	-	-	-
B	1	30%	-	-	-	5,355	10%	535	-	-	-	8,930	5%	446
	2		-	-	-	-	-	-	4,905	10%	490	6,335	5%	317
C	1	25%	3,600	12%	432	-	-	-	-	-	-	12,045	1%	120
	2		-	-	-	-	-	-	6,600	10%	660	8,800	2%	176
D	1	10%	4,050	9%	365	-	-	-	-	-	-	-	-	-
	2		-	-	-	-	-	-	-	-	-	14,180	1%	142
E	1	3%	4,280	3%	128	-	-	-	-	-	-	-	-	-
	2		-	-	-	-	-	-	-	-	-	-	-	-
F	1	1%	5,900	1%	59	-	-	-	-	-	-	-	-	-
	2		-	-	-	-	-	-	-	-	-	-	-	-
G	1	0,7%	8,560	0,7%	60	-	-	-	-	-	-	-	-	-
	2		-	-	-	-	-	-	-	-	-	-	-	-
H	1	0,3%	19,260	0,3%	58	-	-	-	-	-	-	-	-	-
	2		-	-	-	-	-	-	-	-	-	-	-	-
Total		100%		26%	1102		30%	1304		20%	1150		24%	1822
Average Expenditure per dwelling 5378 LL														

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CALCULATION OF THE AVERAGE COST OF COMPLETE URBAN HOUSES
(L.L.)

Income Group	No of dwellings per house	House cost	Percentage distribution per category	Part of the average cost
A	1	6,210	30	1,863
	2	4,370	-	-
B	1	8,930	15	1,340
	2	6,335	15	950
C	1	12,045	13	1,566
	2	8,800	12	1,056
D	1	18,515	9	1,666
	2	14,180	1	142
E	1	24,410	1	732
	2	19,520	-	-
F	1	35,270	1	353
	2	27,865	-	-
G	1	52,120	0.7	365
	2	41,680	-	-
H	1	74,260	0.3	223
	2	57,480	-	-
TOTAL			100%	10,256

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CALCULATION OF THE AVERAGE COST OF HOUSES FOR CIVIL SERVANTS (L.L.)

Income Group	No. of dwellings per house	House cost	Distribution per category	Part of the average cost
A	1	6,210	-	-
	2	4,370	-	-
B	1	8,930	30	2,679
	2	6,335	30	1,900
C	1	12,045	12.5	1,505
	2	8,800	12.5	1,100
D	1	18,515	5	925
	2	14,180	5	709
E	1	24,410	3	732
	2	19,520	-	-
F	1	35,270	1	352
	2	27,865	-	-
G	1	52,120	0.7	365
	2	41,680	-	-
H	1	74,260	0.3	223
	2	57,480	-	-
TOTAL			100%	10,490

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31. Average expenditure for family: We are now in a position to relate the above figures to the categories in dire need of housing:

32. Slum clearance: Because of the very low income of the families to benefit from the Slum Clearance Program, it is assumed that for their resettlement nuclei of the lowest-priced house types will be built, i.e. of the types for income group A. The cost of this nucleus is approximately LL 3,800.
5,000 dwellings at LL 3,800 = LL 19,000,000

33. Decrease in urban density: The evaluation of the expenses for the construction of new dwellings for this group was made on the basis of the cost of the average urban dwelling i.e. LL 5,400 per dwelling.
(8,000 to 10,000 dwellings) x LL 5,400 = LL 50,000,000

34. Housing of Civil Servants: In the case of civil servants complete houses will be constructed. The average expenditure per house was estimated on the basis of the breakdown into income groups of the civil servants yielded by our study of economic phenomena in Lebanon. This breakdown led us to an average price of house for civil servants of LL 10,500.
6,000 dwellings at LL 10,500 = LL 63,000,000.

35. New development projects. For the Litani Development Project and the special industrial Housing Schemes the average price of a house was taken to be the same as the civil servants (LL 10,500).
1,250 dwellings at LL 10,500 = 13,125,000

36. Rural dwellings: For the rural families of the areas to be irrigated and drained, complete houses will not be built for the following reasons:

a. The comparatively low income of the peasants does not leave much margin for the repayment to the State of the cost of the houses on the terms specified in para 18.

b. Owing to the nature of their employment and the fact that at certain seasons of the year they are not fully occupied, the peasants can themselves work on the building of their houses. Thus we arrived at an application of the self-help housing system (referred to in an earlier report). The State will build the nucleus to meet the minimum needs and the family, while occupying the nucleus, will complete it themselves.

It has been assumed in the estimates that the cost of a rural nucleus will be LL 2,200. This is considerably lower than for an urban nucleus for the lowest urban income group, estimated approximately at LL 3,800 (see table page 416), first because the cost of the land in rural areas is very small, secondly because

building work in rural areas is far simpler and therefore cheaper than in the towns and thirdly because the family concerned also participates in the construction of the nucleus. It is significant that if the cost of the land is deducted, the cost of an urban nucleus falls from LL 3,800 to LL 2,800.

2,000 dwellings at LL 2,200 = LL 4,400,000

37. In order to achieve as low as possible a cost for rural houses and nuclei, it is necessary that structural methods, based on standardized and prefabricated elements, be used as widely as possible. Organized mass production of these elements (e.g. roof beams and slabs, lintels, doors, windows etc.) at large sites, situated near the areas which are to be served, can considerably reduce their cost. By using such elements, the designs of which must have been carefully studied, one more great advantage can be obtained which is vital in self-help housing: simple and easy methods of construction are achieved which can be carried out by the villagers themselves, thereby lowering even more the cost of their houses. In this way the full rural self-help housing program could be based on the granting of materials only and on technical assistance to the villagers, who will built their houses by themselves at the lowest possible cost. By granting technical assistance and advice, the Implementation Service of the program acts as a catalyst for reformation of these areas.

38. Total housing requirements and costs: The above five categories require housing amounting to LL 149,525,000. In addition there is the problem of urban and rural rehabilitation, which can be estimated at LL 62 million for the urban and LL 88 million for the rural houses. Further there are the needs of the Palestinian refugees (LL 42,000,000) and assistance towards the development of ten tourists centres (LL 12,000,000) as well as the annual provision of 6,000 dwellings to meet normal replacement (LL 32,000,000). In all, this adds up to a sum of nearly LL 400 million, with 32 million recurring annually. This is shown more clearly in the following table of targets

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PROGRAM OF TARGETS

Non recurring requirements	No of families	Expenditure per family	Total expenditure in L.L.
Urban Programs			
Urban Dwellings	9,000	5,400	48,600,000
Slum Clearance	5,000	3,800	19,000,000
Urban Amelioration	70,000	800	61,600,000
Rural Programs			
New Settlements in New Land	2,000	2,200	4,400,000
Rural Amelioration	80,000	1,100	88,000,000
Special Programs			
Civil Servants	6,000	10,500	63,000,000
Industrial Workers	1,000	10,500	10,500,000
Power Development etc.	250	10,500	2,625,000
Tourism	-	-	12,000,000
Refugees from Palestine	11,000	3,800	41,800,000
		TOTAL	351,525,000

Annual recurring requirements			
Normal increase of population Movement of population Regular replacement of buildings Increase of income	6,000 per year	5,400	32,400,000 per year

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Housing Schemes and House Types

39. The main principle for the study of housing schemes is the creation of units not consisting merely of houses but also containing all necessary community facilities: streets and roads, water, sewers, drainage, electricity. Also the necessary public buildings and spaces: schools, markets, churches and mosques, administration buildings, parks, sports grounds etc. All these are essential to ensure reasonable conditions of living (residence, work, recreation, circulation).

40. Regarding the grouping of incomes we have accepted the principle of "the minimum segregation" allowing the neighbouring of families which belong to a certain income group and the one immediately higher or lower.

41. Other more specific principles followed are: separation of mechanical traffic from pedestrians; provision of schools, parks and recreation spaces reserved for children; adequate conditions of insolation, ventilation and natural lighting.

42. The designing of houses themselves has followed the main idea of creating a series of "fundamental types of houses" which is a basic principle for the rational planning and implementation of the overall program. For similar reasons we have also adopted a system of plots based on a 3m. module. Special attention has been given ensuring maximum privacy by appropriate design of the block of houses as well as of the house itself.

43. Study of the elements of the house led to the designing of house types consisting of completely enclosed open spaces, semi-enclosed spaces and completely open spaces. These spaces are composed so as to allow for the possible future extension of the house.

44. All factors relative to climate, soil, building materials, methods of construction, cost of construction, income of the future occupants, social life, tradition, possibility of earthquakes etc. were taken into consideration.

45. All information necessary for our studies was supplied by Governmental and other official services or by our teams which thoroughly surveyed the country. Some example of house types are given here. Their designation corresponds to a certain family income as already mentioned above in the table on page 416.

URBAN HOUSE TYPES

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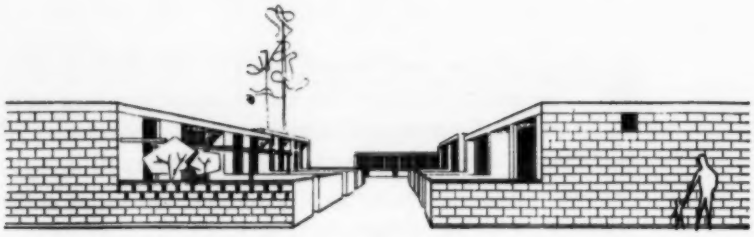
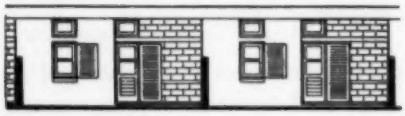
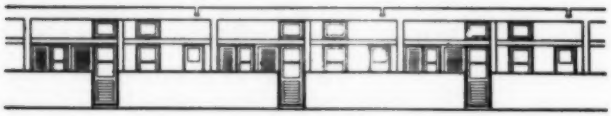
INCOME GROUP

A 031



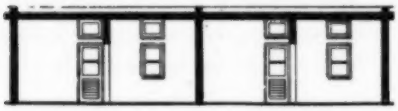


SOUTH ELEVATION



NORTH ELEVATION

SECTION B-B



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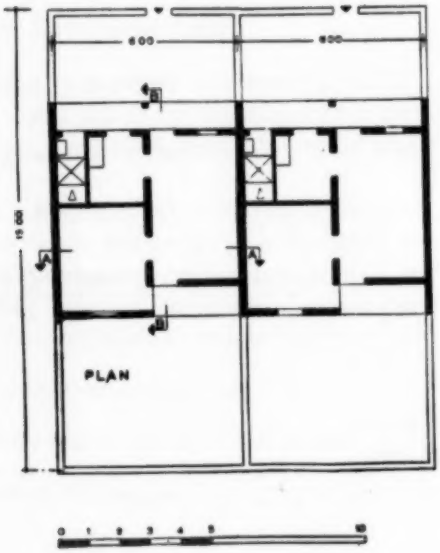

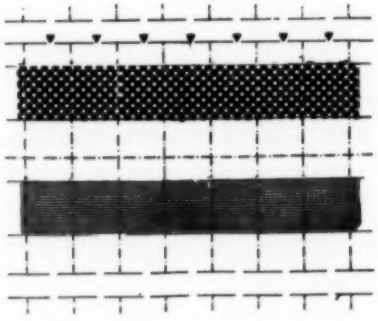

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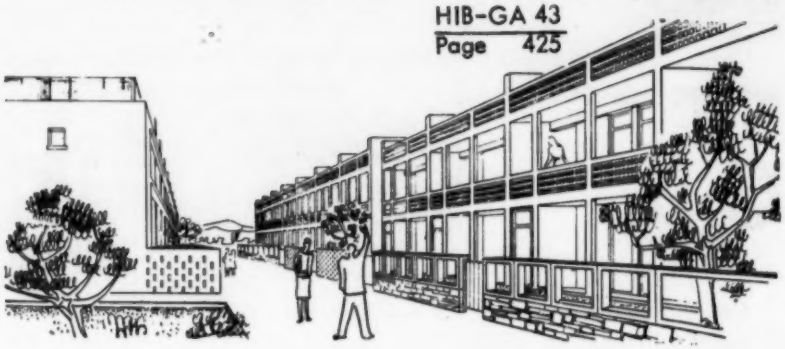
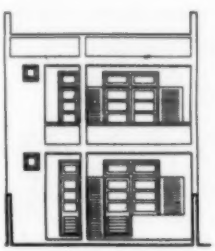
INCOME GROUP

B 022





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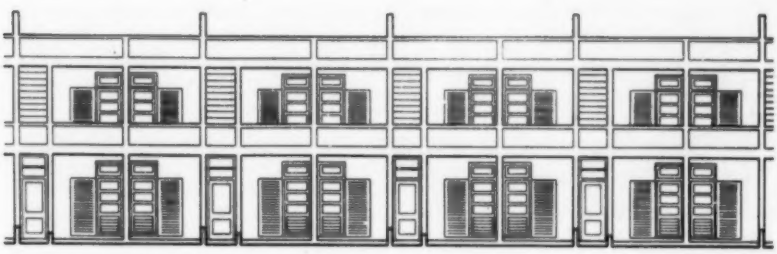
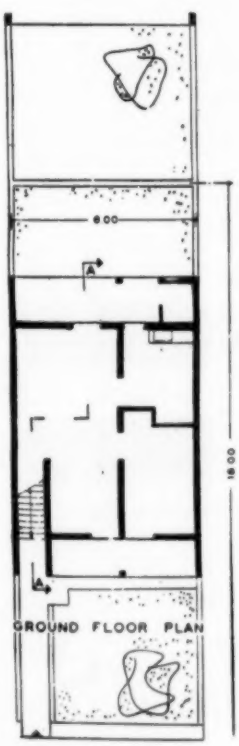
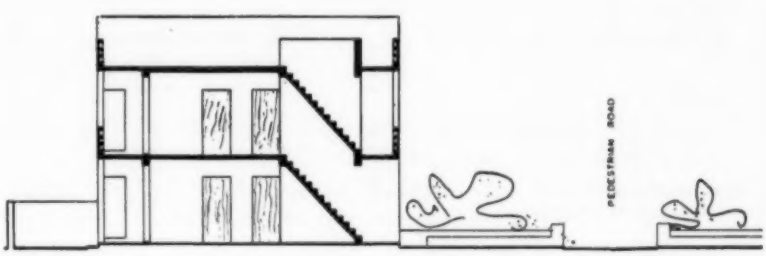


SOUTH ELEVATION



GROUND FLOOR PLAN



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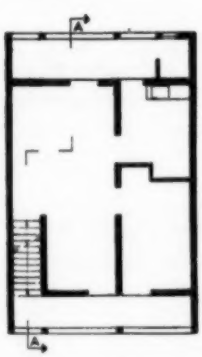
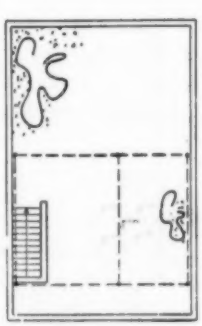
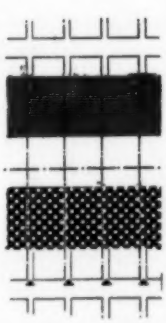


UPPER FLOOR



ROOF GARDEN



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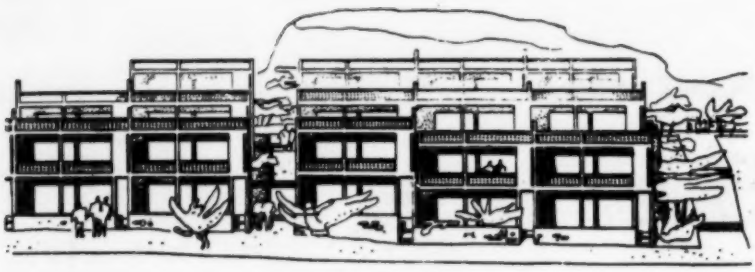
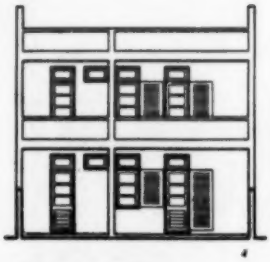
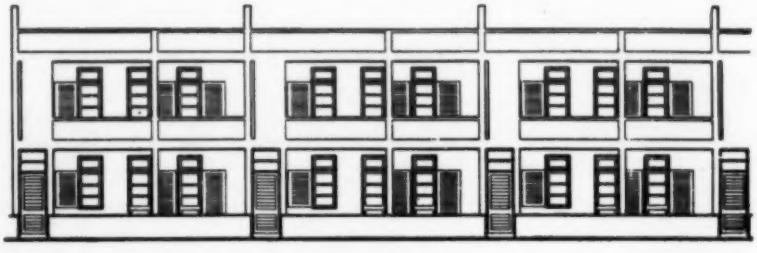
INCOME GROUP

C 012

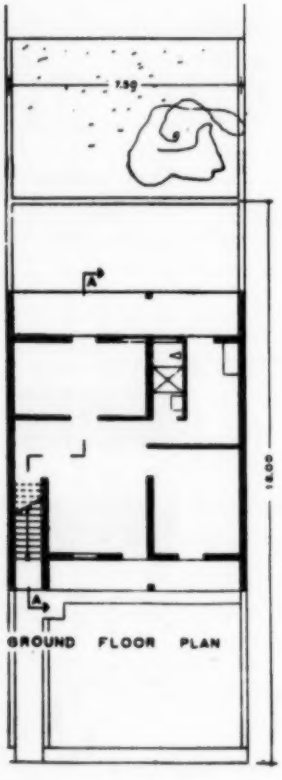




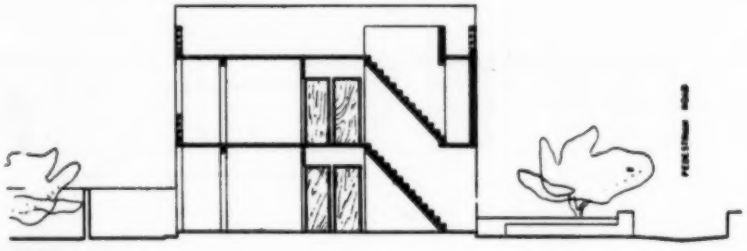
NORTH ELEVATION



SOUTH ELEVATION



GROUND FLOOR PLAN



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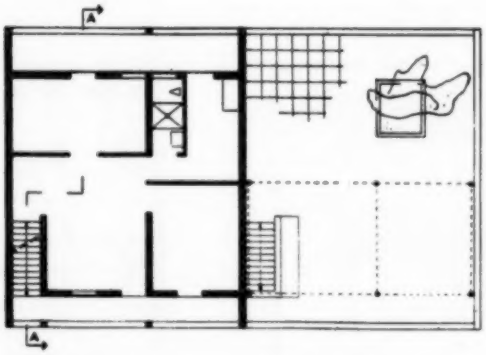
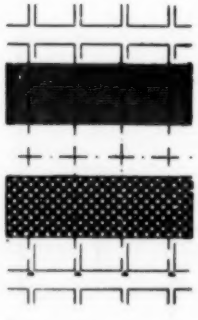


UPPER FLOOR ROOF GARDEN



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THE PROGRAMS

Financing of the Program

46. It is obvious that it will not be an easy matter for the Government and the economy of the country to finance a program providing for an average annual expenditure of the order of LL 50 million which is necessary to meet the need in 20 years. Although, as will be seen below (para 59), the housing program does not only yield indirect returns - by increasing the productivity of the working people - but also direct returns in the form of profit to the investor, the mobilization of so much capital for only one category of development work may prove to be detrimental for other productive investment. The lack of an overall Development Plan for the country makes it difficult for a conclusion to be reached on this matter.

48. Sufficient data are not available to enable us to determine what would be a reasonable level of annual investment in the National Housing Program and to make the relevant recommendations. Apart from the absence of a National Plan, we also lack adequate indications of the actual possibilities of financing from various other sources which might contribute. We shall confine ourselves to mentioning these sources.

a. The revenue derived from present taxation for Reconstruction Board projects, which amounts to LL 10- 12 million per annum. However, as some opposition may arise against the continuation of this taxation it must be borne in mind that the tax for the Reconstruction Board was introduced to serve a limited purpose, whereas the program now proposed will be nation-wide.

b. Bearing in mind that a considerable proportion of the expenditure for the implementation of a housing program (20-25%) will be devoted to the import of materials, the Governmental should examine the possibility of obtaining the required funds in foreign exchange out of American Aid.

c. A third source might be the annual surplus of the Current Budget which, during the fast few years, was as follows:

LL	36	million	in 1952
"	45	"	" 1953
"	46	"	" 1954
"	46	"	" 1955
"	25	"	" 1956

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The Surplus of the Current Budget of the Central Government is transferred to the Reserve Fund, whence a part of it is allotted to the financing of Development Works Funds, while a part remains unused and increases the Reserve Fund. Consideration should therefore be given to the possibility of financing the Housing Program out of the Reserve Fund.

d. The conclusion of either a foreign or a domestic loan would be another source. Such a loan would have the advantage that its repayment is guaranteed by the fact that the persons to acquire the housing facilities are to refund the expenditure in monthly or annual instalments.

e. Finally, consideration should be given to the possibility of introducing tax on luxury constructions to the benefit of the overall housing development. The value of these constructions is estimated at LL 70- 80 million per annum, so that taxation at a rate of 5 per cent would yield LL 3.5-4 million per annum. It cannot be considered that such taxation would have an adverse effect on the economy, since both those who build and those who occupy luxury constructions belong to the higher income groups which are not affected by small rises in prices.

48. We would repeat that we merely mention the above sources of financing without being in a position to make specific recommendations. The outline of the Basic Foundation Program given below is based on the following:

a. Our conclusion that the implementation of a housing program of the order of LL 30 million per annum is possible both from the angle of financing and from that of execution.

b. The belief that it will be possible to raise a loan to bridge the gap remaining after the financing of such a program by the Government.

c. The conclusion drawn from a study of the returns yielded by a long-term program to be financed annually by a certain amount, that such financing will be necessary at the beginning for a certain number of years, but that afterwards it will be possible for the Program to pay its own way out of the proceeds of the instalments which the beneficiaries will pay for the houses and facilities they receive. These conclusions are stated below in para 62, page 433.

The Basic Foundation Program

49. The Basic Foundation Program is the name given to the first stage in the implementation of the long Term Program. It is calculated to occupy five years (but might turn out to be rather more or less) and would be the basis upon which succeeding five year programs would be planned.

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50. The Basic Foundation Program has been taken as of the order of LL 30 million per annum, since (as already mentioned) it is considered that under the present economic conditions of the country, financing to this extent will be possible, and such expenditure will permit a number of basic and very pressing housing needs to be met. As regards the needs of the long-term program previously estimated, it is not possible to meet even those which will occur annually. It is emphasized again however that the effectiveness of the program will depend on its ability to mobilize private interest and private capital.

51. On the basis of social as well as economic criteria the following have been included in the Basic Foundation Program.

a. Slum Clearance
The total needs in slum clearance, mainly for social reasons but also in order to increase the productivity of the slum dwellers.

b. Decrease in Urban Density
Only 11,500 urban dwellings, as compared with 15,000: 9,000 in the long-term program for non-recurring needs plus 6,000 for annually recurring needs.

c. Housing for Civil Servants
One third of the total needs in housing for civil servants (2,000 dwellings, as compared with 6,000 in the long-term program). Priority should be given to civil servants working in the rural areas.

d. New Development Projects
The dwellings necessary for the technical personnel to be employed during the first stage of the Litani project (not considered to be a charge on the Housing Program, since the necessary provision has been made in the Litani projects: also half the needs in housing for industrial workers (500 dwellers, as compared with 1,000 in the long-term program).

e. Rural Dwellings
The total number of dwellings (500) necessary for the exploitation of the first phase of the Litani irrigation project.

f. Urban and Rural Amelioration
About 7% of the needs in urban amelioration and about 40% of the needs in rural amelioration.

g. Tourism
30% of the works serving tourism provided for in the long-term program. It is not considered that these projects will ultimately be a charge to the Housing Program, since they will be paid for out of revenue yielded by the tourist industry.

52. No provision is made in the Five-Year Program for the housing of Palestinian refugees.

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53. A much greater amelioration program is provided for in rural areas than in urban districts, since from the point of view of size these are the most important housing projects in rural areas; they must, however, be incorporated each time within a community development plan.

54. Total expenditure for the rural program is much lower than for the urban program (LL 34,100,000 as compared with LL 85,500,000), but the rural program will meet the needs of a far greater number of families (30,500 as compared with 21,500). Thus a balance is to some extent achieved between the two programs. It might be well to emphasize at this point that the rural areas are in great need of assistance and should not be neglected in favour of the towns. Their needs in the sector of housing can be met at a much lower cost than those of the towns.

55. Community buildings and shops: Apart from the various other works referred to in this document, every settlement needs certain community buildings, such as schools, churches or mosques, an administrative center, a community center, health center, stadium, market, etc. These buildings must be studied and built at the same time as the rest of the settlement, otherwise it cannot function adequately, but they must not be a charge on the Housing Program. The necessary expenditure must be borne by the Ministries or Organization concerned, e.g. by the Ministry of Education for the schools, the appropriate religious bodies for the mosques and churches, the Ministry of the Interior for the administrative centers, etc.

56. There is also a category of buildings which must be definitely financed by the Housing Program but for which the Program will be reimbursed out of the proceeds of their allotment. These comprise the market - which includes shops, a coffee house, etc. - public baths, possibly the hostel, etc. They will be built and disposed of on the same principles as the houses: i.e. the purchasers will be debited with their value - in this case it may not be simply the costs of construction but possibly a higher commercial value - and will pay for them in instalments, at a certain rate of interest, within a specific time, possibly shorter than that allowed for the houses.

57. These are the reasons why a special item is charged to the Program for these buildings, their total value being estimated at about 5% of the cost of construction of the houses and community facilities (experience has shown this percentage to be correct). But in the diagrams illustrating the returns of the Program (page 433) they have been regarded as a normal source of revenue of the Program and have not been separated from the houses. None of the other community buildings (schools, churches and mosques, administrative center, community center, etc.) have been included in the outline of expenditure for the Basic Foundation Program. (see para 55).

58. The following tables show the tentative expenditure of the Basic Foundation Program and the estimated contribution to be made by private enterprise.

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FIVE YEAR HOUSING PROGRAM

Program	No. of Families	Expenditure per families	Total Expenditure in L.L.
Urban Programs			
Urban Dwellings	11,500	5,400	62,100,000
Slum Clearance	5,000	3,800	19,000,000
Urban Amelioration	5,000	880	4,400,000
Rural Programs			
New Settlements in New Land	500	2,200	1,100,000
Rural Amelioration	30,000	1,100	33,000,000
Special Programs			
Civil Servants	2,000	10,500	21,000,000
Industrial Workers	500	10,500	5,250,000
		Total for housing	145,850,000
		Expenditure for buildings to be financed by the Housing Program	4,150,000
		Total five year program	150,000,000
Special programs which will not be financed by the Housing Program			
Power Development etc.	130	10,500	1,365,000
Tourism			3,600,000
Expenditures for buildings to be financed by other Ministries and organizations			20,035,000
		Total	25,000,000

PARTICIPATION OF PRIVATE CAPITAL OR LABOUR IN THE FIVE YEAR HOUSING PROGRAM

Program	No of Families	Per family Private Contribution (in Capital or Labour)	Total Private Contribution	Total Government Capital Contribution	Level of Total Five-Year Housing Investment
Urban Programs					
Urban Dwellings	11,500	4,900	56,350,000	62,100,000	118,450,000
Slum Clearance	5,000	2,400	12,000.000	19,000,000	31,000,000
Urban Amelioration	5,000	200	1,000,000	4,400,000	5,400,000
Rural Programs					
New Settlements in New Land	500	3,000	1,500,000	1,100,000	2,600,000
Rural Amelioration	30,000	300	9,000,000	33,000,000	42,000,000
Special Programs					
Civil Servants	2,000	-	-	21,000,000	21,000,000
Industrial Workers	500	-	-	5,250,000	5,250,000
	Total for Housing		79,850,000	145,850,000	225,700,000
Expenditures for buildings to be financed by the Housing Program			150,000	4,150,000	4,300,000
	Total five year program		80,000,000	150,000,000	230,000,000

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Labor Employment

59. Due regard must be given to the great importance which an extensive Housing Program has regarding not only the creation of dwellings - which is, of course, the aim of the Program - but also in connection with the effort to reduce unemployment.

60. According to a rough estimate, the Basic Foundation Program which we proposed will initially create productive employment for about 3,000 workers annually and this number will be gradually increased up to 5,000.

61. No accurate statistical data exist of the number of unemployed. According to certain documents, however, the figure is in the region of 40,000. Taking into consideration that underemployment in agriculture is not included in this figure, the number of unemployed must be regarded as fairly high. This, as far as rural areas are concerned, is substantiated by the great tendency towards emigration.

Returns of the Program

62. Our entire study of the housing problem of Lebanon and our recommendations for the Basic Foundation Program are based upon a fundamental principle: that the houses, and other housing facilities to be created under the Program, will be sold to the beneficiaries on easy terms - payment in long period instalments, according to income. At the same time a yearly yield of at least 2-3% for the program's finances will be assured.

63. An exception to this rule may be acceptable for people of extremely low income, where it is impossible to insist on the requirements. In such cases, the Government, for social reasons, may give a certain subsidy to the beneficiaries by granting part of the cost or simply by reducing the interest. However, this should be done only in exceptional cases and the subsidy should be as low as is practicable.

64. In certain instance, houses have to be rented instead of being sold; for example, in the case of settlements for industrial workers or civil servants who are not permanently stationed at their posts. Here too, however, the rent should give the proper yield to the invested capital. Nevertheless, it is better to avoid rentals as far as possible because they are characterized by poor maintenance by people who are not owners of the houses they inhabit.

A Revolving Fund

65. It is easy to prove that a program having an annual level of L, and which disposes of its production at a 3% interest in twenty annual instalments with a 20% down-payment, will be self-financing after the 17th year. The total capital which will be required up to the 17th year is approximately 7.5 L. From then on, the annual income from disposal of the housing facilities produced is higher than the corresponding expenses. Therefore, financing is no more necessary.

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The program is now carried out through its own resources with increasing output up to the 22nd year and at this stage the output becomes constant and equal to 25% of L. If it is desired, this surplus can be used to recover the capital which was laid out, free of interest, round about the 45th year from the start of the program. On the other hand, if the surplus is incorporated in the program a continuously increasing annual level of fulfilled program will be achieved.

66. If a subsidy is granted to the lower incomes, let us say at an average of approximately 10% of the total program revenue, the above data will show as follows: Financing amounting to 8.5 L up to the 20th year. Capital recovery, without interest, up to the 55th year. Constant output of the program 13% of L.

A Program of LL 30 million per year

67. Three alternative methods of financing this program were studied in some detail, but the most feasible seemed the following:

68. Financing by the Government and through loans: Let us take a program similar to the Basic Foundation Program having an annual output of LL 30,000,000 and financed as follows:

a. Annual Government contribution LL 12,000,000 until such time as the necessary revolving fund is formed so that the program can proceed on its own after paying the loan referred to in (c) below.

b. By payment of instalments on Housing Facilities produced, accepting that such payments will be carried out as follows:

   i. Houses and plots: Twenty annual instalments, 3% interest, 20% down payment.

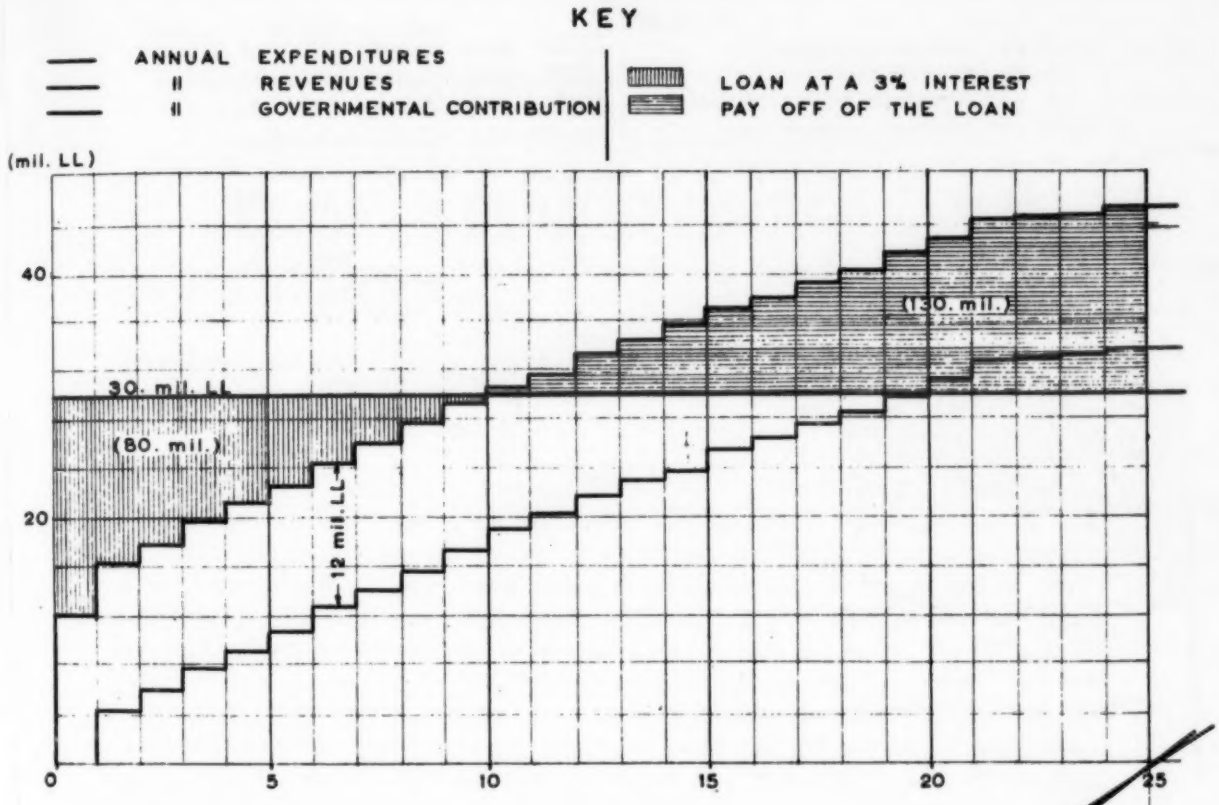
   ii. Amelioration works: Ten equal annual instalments.

c. By a loan which will cover the gap of financing until such time as the program becomes self-supporting.

69. We have accepted as a subsidy only 20% of the Housing Facilities allocated to Income Group A, as also a reduction of interest to 2% for this same group. We have also accepted that only a percentage, varying in each instance, of the expenditure for amelioration works will be recovered. The diagram on page 435 shows the curves for financing, and the output of, this program. The following conclusions are drawn from this diagram:

a. The gap in financing, which has to be covered through a loan, (see above para 68 c), amounts to 80 million LL. This loan must be granted during the first ten years. The highest instalments equal to 18 million LL will be paid in the first year.

DIAGRAM OF ANNUAL EXPENDITURES AND REVENUES OF THE LONG-TERM HOUSING PROGRAM OF LEBANON



CUMULATIVE DIAGRAM OF EXPENDITURES AND REVENUES OF THE LONG-TERM HOUSING PROGRAM OF LEBANON

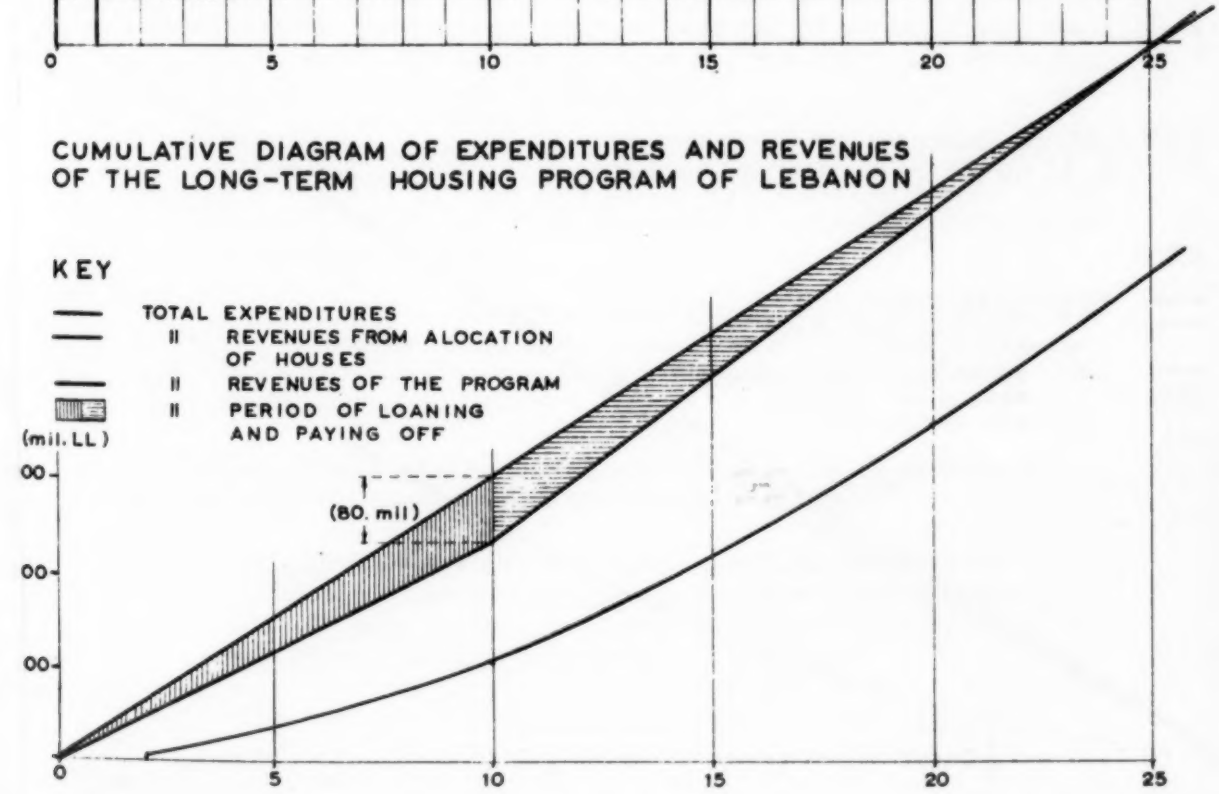
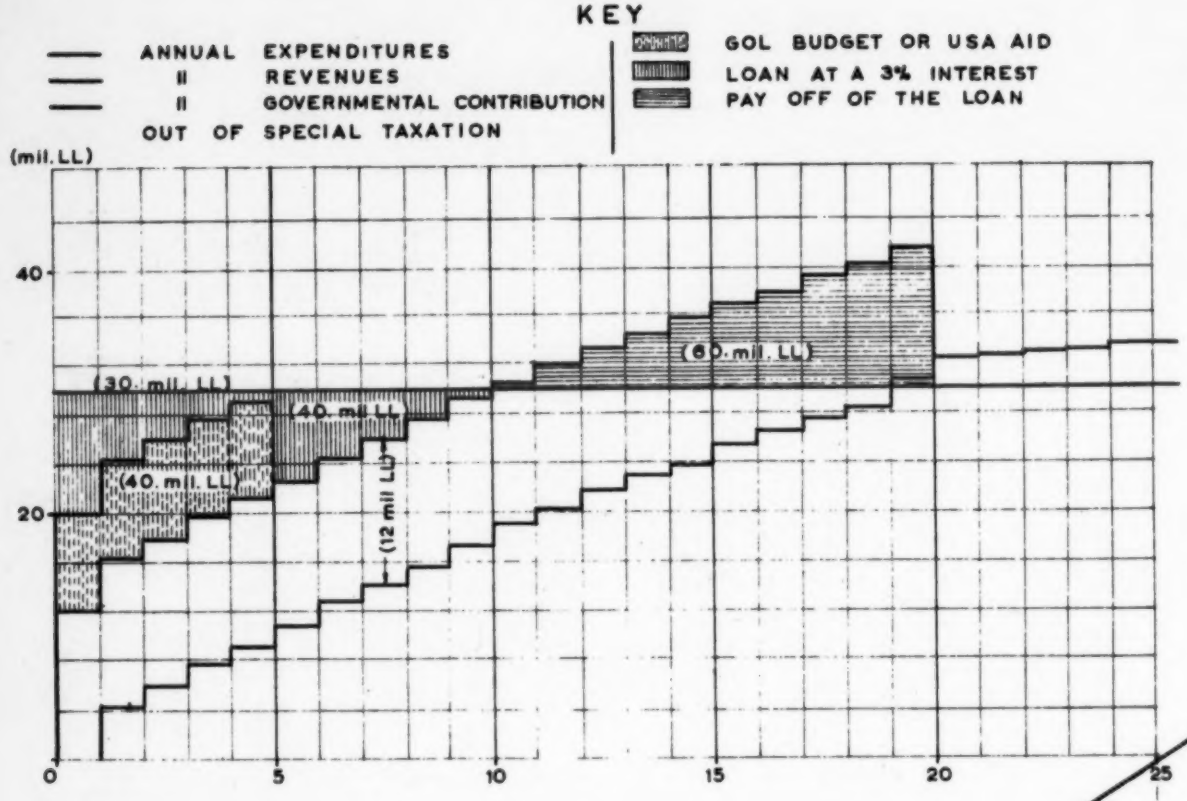
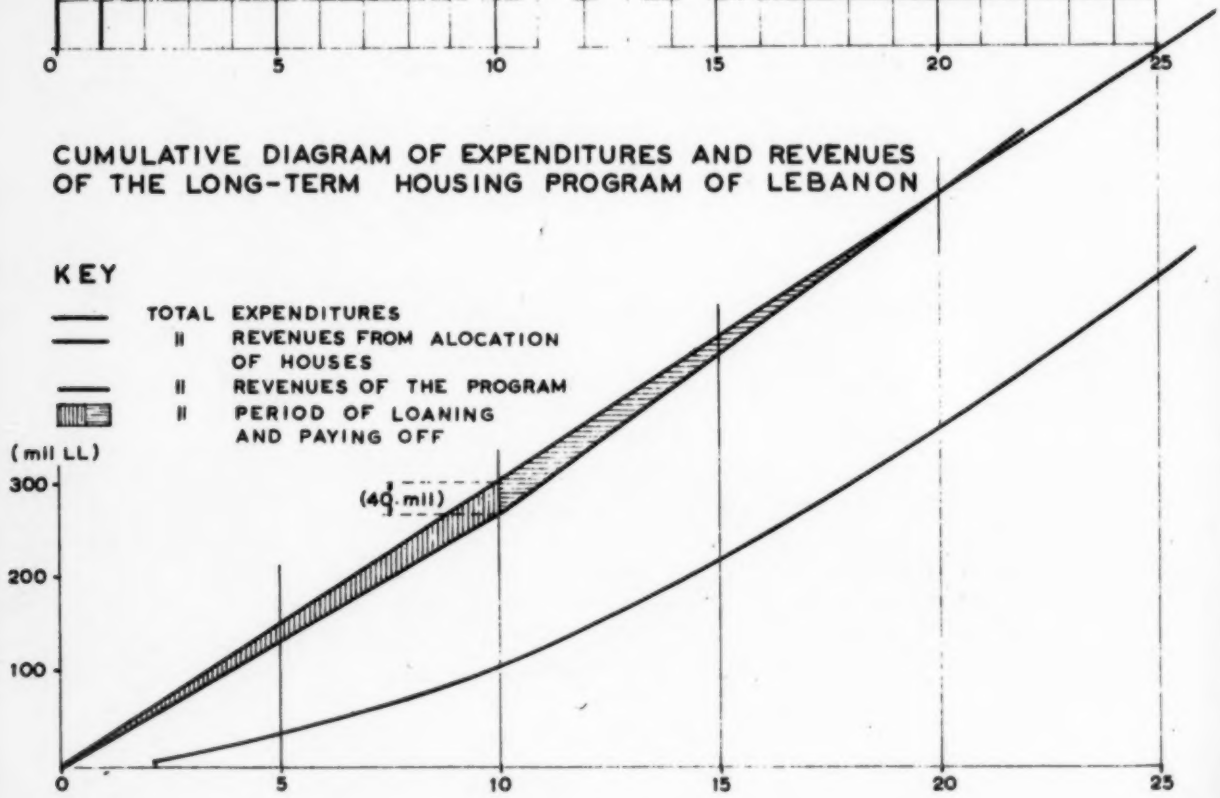


DIAGRAM OF ANNUAL EXPENDITURES AND REVENUES OF THE LONG-TERM HOUSING PROGRAM OF LEBANON



CUMULATIVE DIAGRAM OF EXPENDITURES AND REVENUES OF THE LONG-TERM HOUSING PROGRAM OF LEBANON



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b. After the tenth year the program's revenue is higher than expenditure. The loan, together with its interest, which has been calculated at 3% compound interest, will be paid back through the surplus which increases each year. Final payment will have been made in the 25th year from the date on which the loan is granted, or in the 15th year from payment of the final instalemnt of the loan. The total sum which will be required for full settlement, including interest, will be 130 million LL.

c. Contribution by the Government of 12 million LL annually will be necessary up to the 25th year. The total Government contribution will, therefore, amount to 300 million LL.

70. Additional contribution from the GOL Budget or from foreigh aid: If we accept, for the first 5 years, an additional contribution to the Program of LL 8 million annually, from the Central State Budget or from American aid in direct or indirect form (i.e. import of building materials needed for the Program), the diagrams show a much more favourable situation. In this case the required loan amounts to only LL 40 million, to be paid over the first ten years, the largest instalment amounting to LL 10 million, being paid during the first year. The loan will be repaid by the end of the 20th year (see diagram on page 436) and the total sum which will be required for its repayment will be LL 60 million. Lastly, the Government's contribution will only be required up to the 20th year, by which time it will amount to a total ot LL 240 million.

71. Government Housing Authority. For the success of a Program such as that described in the preceding pages there is an imperative need for the establishment of a Government Authority which will be responsible for Housing, since at present there is no such body in Lebanon.

72. The sole exception is the National Reconstruction Board which was set up to deal with the destruction caused by the recent earthquake. This might form the nucleus of the new Authority, since it would not be reasonable to have two bodies responsible for housing.

73. A fundamental problem connected with the jurisdiction of the Housing Authority will be to choose between the following alternatives:

a. The assignment to the Housing Authority of responsibility for the conception, programming, designing, implementation and supervision of projects, the administration of the Revolving Fund for Housing and the management of the new settlements.

b. The assignment of the technical side of Housing, i.e. the implementation, supervision etc. of projects to another Authority.

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74. It is considered that the first alternative is preferable since it will ensure:

a. Unity and coordination at the stage of conception and implementation of the works.

b. Rapid and satisfactory progress in the works as a result of the concentration of all Government activity connected with Housing in a single new Authority, which will, for this reason, be in a position to obtain the services of tried and competent officials seconded from other Departments, or of other experts.

75. If the Government of Lebanon approves and agrees to the first alternative indicated above, the main responsibilities of the Housing Authority might be the following:

a. To study and draft the Housing Program.

b. To study and draft the Housing Budget.

c. To approve studies for the execution of works.

d. To supervise the execution of works.

e. To allocate the houses to beneficiaries on the basis of certain established criteria.

f. To administer the Management funds raised through the 1% surcharge.

g. To collect the instalments on the houses sold.

h. To manage the settlements until they have been fully paid for.

i. To maintain the settlements until they have been fully paid for.

j. To set up a Revolving Fund out of the proceeds of the sale of the houses and to administer this Fund in accordance with the instructions of the Government.

76. The Housing Authority which, as indicated by the above, will be the custodian of all property in the field of Housing and of the Revolving Fund and the Government executive authority with regard both to planning, programming, designing, implementing and supervising the Housing Projects and to managing the settlements, will come under the authority of the Minister of Social Affairs, in view of the social character of this Program. The Minister of Social Affairs will be the member of the Government responsible for making recommendations

to Parliament and to the Government on matters connected with Housing and falling within their competence. Such matters are the Housing Program and the Housing Budget, on which recommendations will be made by the Minister, after consultation with the Housing Authority.

77. It is not within the scope of the present document to consider the details of the organization of the Housing Authority. It may however be mentioned that the principal agencies of the Housing Authority will be:

78. The Board, which might have seven members appointed by the Government and be assisted by the Housing Consultant.

79. The Director General who will be responsible to the Minister in charge.

80. Four directorates:

(1) Planning, Programming and Designing;

(2) Implementation of Projects;

(3) Management;

(4) Economic Services.

81. If the Housing Authority is approved, it would be advisable if the Law establishing it were also to lay down certain basic principles of policy governing the functioning of the Authority.

82. These basic principles are that:

a. The houses must be sold to the beneficiaries, since this is dictated by social, economic and political considerations.

b. The beneficiaries must pay the total cost of the house. Only in exceptional cases, where the lower income groups are concerned, will it be necessary for the State to bear part of the cost of the house, in the form of a subsidy.

c. All the proceeds of the sale of houses must be again allotted for housing purposes, so as to form a Revolving Fund for Housing.

d. All sources of funds to be made available for the Program must be defined (taxation, budget, reserves, loans etc.).

e. Provision must be made for the existing legislation to be adapted to the needs of the Program. This especially refers to expropriation

and land acquisition. All procedures required for implementation of the Program must be simple and expeditious. It will probably be necessary to facilitate the implementation of the Program avoiding intrusion of the complex formalities of Public Accounting.

List of Recent Publications of Interest

Great Britain. Ministry of Housing and Local Government.
Flats and houses 1958: design and economy. London, HM Stationery Office, 1958. 154 pp. Illustrations, plans. (10 s.)

Haar, Charles M.
Land-use planning: a casebook on the use, misuse, and re-use of urban land. Boston, Little, Brown and Co., 1959. 790 pp. Illustration, plans, map. ($10.00)

McKaig, Thomas H.
Field inspection of building construction. New York, F.W. Dodge Corp., 1958. 337 pp. ($9.35)

Milne, A.M.
The economics of inland transport. London, Sir Isaac Pitman and Sons Ltd., 1955. (£1.5.0)

Nelson, Richard.
The selection of retail locations. New York, F.W. Dodge Corp., 1959. 422 pp. Illustrations, maps, diagrams, tables. ($9.00)

Owen, Wilfred.
Cities in the motor age. New York, the Wilson Press, 1959. 176 pp. Photos. ($3.95).